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EVALUATING METHODS FOR MEASURING VISITOR PERCEPTIONS OF ECOLOGICAL IMPACTS AT WILDERNESS CAMPSITES

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Evaluating Methods for Measuring Visitor Perceptions Of Ecological Impacts at Wilderness Campsites

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EXECUTIVE SUMMARY

Establishing carrying capacities is an often-suggested solution for problems of over-use. Capacity determinations require both descriptive and evaluative information. Managers and users may have different views of evaluative standards. This study compares three methods for measuring visitor perceptions of ecological impacts: actual site visits, photographs, and written descriptions (pp. 1-9).

Studies in landscape assessment have compared on-site and photographic procedures similar to those used in this study. They most often emphasize general features of large scale landscapes rather than specific characteristics of small scale sites. The present study hypothesizes that evaluations based on on-site, photographic, and written methods will not be significantly different (pp. 9-16).

Data were collected in the Jefferson Park and Hunts Cove areas of the Mt. Jefferson wilderness. Evaluations focused on two forms of impact, bare ground and fire rings. A total of 427 persons participated in the study, a 95% response rate. After responding to general questions about camp site selection and backcountry experience, visitors evaluated sites based on a site visit, photographs, or a written description (pp. 16-27).

Finding: For evaluations of specific impacts, the photographic method agreed with site evaluation 90% of the time, and the written method agreed with site evaluations 80% of the time (pp. 28-30).

Finding: There were a larger number of significant differences between methods for more general evaluations of desirability and preferences (pp. 30-31).

Conclusion: With careful study design, it seems reasonable to use photographic or written descriptions in place of site visits for evaluating

specific impacts.

Finding: The study was not designed to develop evaluative standards, but the data allow us to explore the issue. Evaluative standards for bare ground range from 700-1500 square feet. Evaluative standards for fire rings range from 22-36 inches in diameter (pp. 31-38).

Conclusion: The study suggests ways to collect and organize data for developing evaluative standards based on larger sample sizes.

Finding: The most commonly mentioned site selection criteria were views of scenic features, quality of the tent site, shelter from weather, proximity to other camps, and distance from the lake (pp. 38-44).

Finding: In evaluating specific impacts, horse riders generally tolerate larger areas of bare ground and larger fire rings. There are fewer differences between the two groups in more general evaluations of desirability and preference (pp. 44-48).

Finding: Visitors in the sample were young and predominantly male. Over 80% traveled in groups of 1-4 persons, and most had visited the study area before. Most had graduated from college, and about half were married (pp. 48-49).

Conclusion: Differences between <u>specific</u> evaluations based on the different methods can generally be explained in terms of the inability of the photographic or written descriptions to accurately portray the impacts in question. This conclusion agrees with findings of previous studies (pp. 50-54).

Conclusion: Differences in more <u>general</u> evaluations appear to result from the inability of photos or written descriptions to give detailed information about the general site context and relationships among features (pp. 54-57).

Conclusion: Evaluative standards developed in this study illustrate some of the principles of encounter norms developed in earlier studies. For

example, standards appear to vary depending on the level of use at the area under investigation (pp. 57-60).

Conclusion: Findings regarding the importance of scenic views, tent sites, shelter, and solitude in campsite selection are supported by other studies (pp. 60-63).

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Evaluating Methods for Measuring Visitor Perceptions of Ecological Impacts at Wilderness Campsites

INTRODUCTION

Problems of Over-Use

According to the Wilderness Act, wilderness is meant to be used and enjoyed. Yet it is defined as "affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable" (Public Law 88-577). Managers of our wilderness areas would probably agree that wilderness should be managed on a non-degredation concept, but it is obvious that use and enjoyment of an area cannot occur without some form of measureable impact.

Over the past 20 years recreational use of wildlands has increased dramatically. At least 20 times as many people visit wilderness now as compared to the 1930's (Hendee et al., 1978). This increase in use has caused managers and visitors alike to worry that many wildland recreation areas are being over-used.

One solution to the problem has been to establish carrying capacities for areas that are suffering from crowding or over-use. According to Wagar (1964) setting carrying capacities for areas where use has become a problem sounds easy enough, but trying to specify a

particular number is extremely difficult. Early work by Lucas (1964) and Wagar (1964) were the first attempts at applying the carrying capacity concept to recreation. Other studies have looked at various frameworks for establishing carrying capacities to help solve the problems created by over-use (e.g., Lime and Stankey, 1971; Stankey, 1974; Badger, 1975). Recently, Shelby and Heberlein (1982) have developed a basic conceptual framework for carrying capacity which can be applied to a variety of situations. Establishing carrying capacities requires knowledge of both descriptive and evaluative components. The descriptive component focuses on objective characteristics of recreation systems; it specifies the different states produced by different management actions. The descriptive component involves management parameters, impact parameters, and the relationship between the two.

Descriptive Component

Management Parameters

Management parameters are factors controlled and manipulated by managers (e.g., use levels). Management actions which have been used in wilderness areas include closing highly disturbed sites either temporarily or permanently, designating campsites, and limiting use around lake shores.

Impact Parameters

Impact parameters describe what happens to visitors or the resource as a result of management actions such as limiting use. Examples

include the number of parties camping in a given area, the number of encounters on trails or at camps, and the percent of vegetation damaged or lost. Managers assume that the actions they take to control use will be beneficial for both the visitor and the resource. Shelby and Heberlein (1982) describe four types of impact parameters.

Ecosystem parameters help define the ecological capacity of an area. Ecological capacity refers to the amount of recreational use an area can withstand without unacceptable changes to the ecosystem. Examples of ecosystem parameters include the extent of multiple trails, number of square feet of bare ground at campsites, size and appearance of fire rings at campsites, and the depth of soil compaction at campsites.

Space parameters help define the physical capacity of an area. Physical capacity involves the amount of undeveloped space available to visitors. The number of square feet of flat sleeping area per person, the amount of campsite space for a given area, or the number of parties per campsite are all examples of space parameters which help define the physical capacity of an area.

Development parameters are used to help define the facility capacity of an area. Facility capacity is described as the number of people who can use man-made improvements designed to handle visitor needs. Pit toilets or horse corrals might affect facility capacity in wilderness.

Experience parameters are impacts which help define the social capacity of an area. Social capacity refers to impacts which might alter human experiences. Such things as number of trail encounters, number of encounters with parties of a particular size and type, or the number

of other parties within sight and sound of a campsite are all impact parameters which could be used to establish a social capacity for an area.

Evaluative Component

The evaluative component involves value judgments about specific levels of impact which can be used to develop evaluative standards. Evaluative standards specify which level of impact is tolerable (the maximum) or most desirable (the optimum). Problems arise in deciding whose value judgments will be used in establishing these standards. Ultimately managers will specify standards which are based on sound management objectives and other factors, but should these decisions be based on managers' viewpoints alone?

Managers' and Users' Views

Who decides what constitutes an unacceptable impact, managers or users? For the most part, evaluative standards which define acceptable limits of change (especially ecological change) for wilderness areas have been based on the value judgments of managers. These judgments often lack information about how visitors to these areas perceive impacts.

Managers are usually concerned about site degredation, but it does not follow that the public will perceive such degredation as unacceptable or undesirable (Hendee and Harris, 1970). In a study by Lucas (1970), Forest Service administrators ranked the quality of

recreational sites much differently than users. Peterson (1974) also found that managers were more aware of "the depreciatory consequences of recreation use" than visitors. Brown and Shoemaker (1974), in a study which looked at functional and desirable characteristics of existing sites in the Spanish Peaks Primitive Area, concluded that from the visitor's perspective, the "best" sites were the ones with the heaviest impact.

Most managers are trained in the biological sciences and are familiar with ecological processes, and working in the same environment gives them the opportunity to observe trends, whereas a visitor unfamiliar with the area would most likely be unaware of any change. Visitors deal with impacts which are confined to individual sites, and are not aware of change which takes place over large management units (Hendee and Pyle, 1971). Managers may also be directed by Regional Guidelines or Forest Policy to take action in some instances.

So although impacts beyond a certain point are perceived by managers as unacceptable, the question remains: Does the visitor perceive the same degree of impact as unacceptable? The available literature which focuses on campsite impacts suggests that campsite degredation resulting from visitor impact does not significantly influence visitors' choices of campsites or their overall satisfaction with a particular site (Lucas, 1979). A study by Dunwiddie and Heberlein (1975) observing visitors in the Wind River Mountains of Wyoming showed that the most important factor in campsite selection was that the site characteristics meet the structural needs of the group (such as size, principal activity, and method of cooking). The authors also observed

that "worn and littered" sites were more frequently selected by visitors.

How visitors perceive campsite impacts is not well documented. Studies which do look at visitor evaluations of campsite impacts (Frissell and Duncan, 1965; Stankey, 1973; Lee, 1975; Merriam and Smith, 1978; Harris, 1978) generally focus on how the impacts relate to levels of satisfaction and not whether the impacts are perceived as acceptable or unacceptable. According to Lucas (1980), knowledge about impacts lacks clear goals and a definition of acceptable conditions.

Research on how visitors perceive ecological impacts at campsites would be beneficial to managers who specify the evaluative standards that determine carrying capacities for wilderness settings. Shelby and Heberlein (1982) suggest a strategy for measuring individual preferences or using individual values to come up with evaluative standards for specific impact parameters.

Study Purpose

The preceeding discussion helps specify the information needed to develop evaluative standards for ecological (or other) impact parameters in wilderness. It also points out the need for research to gather information about how wilderness managers and visitors perceive certain forms of impact. The problem in gathering this information is selecting a method to accurately measure people's perceptions of impacts. Choosing a "best" method is a precursor to any study intending to develop evaluative standards for impacts.

This study focuses on the methodological issue of how to best measure visitor perceptions of two forms of campsite impacts (bare ground and fire rings). An on-site evaluation was used as the criterion for evaluating other methodological approaches.

Measurement Methods

The study compared 3 alternative methods for giving visitors information about ecological impacts at campsites: (1) on-site visits, (2) photographs of the site, and (3) a written description of the site.

On-Site Method

The ideal method would be to take visitors to actual campsites which have incremental degrees of degredation and then have them evaluate the impacts. The on-site method would provide the person evaluating the specific impacts with a direct exposure to the environment and would seem to be the best technique. However, there could be a number of difficulties created by the on-site method.

When using the on-site method to evaluate ecological impacts it is likely that a number of sites will need to be evaluated at different locations. Visitors will have to view each site, and the travel time between sites, plus the time it takes to answer questions, could be prohibitive for both the visitor and investigator. Another disadvantage to the on-site evaluation is that campsites used for the study would need to be closed for part or all of the season to insure that no modifications of existing impacts occur. During peak use periods this could cause unnecessary hardships on visitors who would otherwise have

selected these sites but are now forced to search for other sites that meet the needs of their group. This could shift impact to new sites, or increase impacts at established sites.

Weather is an unpredictable factor which could delay implementation or completion of a study. A heavy snow which lingers until mid-summer or unseasonably early snow could prevent completion of a study and require that research be continued the following season. The accessability of the study area might also influence the population being sampled. There is a need for alternative methods which can accurately represent impacts in the same manner as an on-site evaluation.

Photographic Method

Photographs have been used in many landscape studies where there has been a concern for perception and preferences. They have been found to be acceptable surrogates because they can be used with greater economy, speed, and control than real world situations (Shuttleworth, 1980). However, according to Shuttleworth (1980), perceptual distortions can and do occur when a surrogate environmental display such as a photograph is used. He considers 3 main aspects.

First, the most obvious source of variation between photographs and actual on the ground view is that there may be a difference in content. This is because the eye takes in a much larger field of view than the camera. This can be overcome by taking multiple wide-angle, single-frame photographs and splicing them together, but this is an expensive process. Second, there is a perceptual distortion between the physical nature of the view and photograph. On-site views consist

of three-dimensional objects which have varying distances in space, whereas photographs are a two-dimensional image of the real world situation which have been obtained by a less complex optical system. Finally, photographs are less likely to allow the viewer to accurately perceive color, shape and distance.

Written Method

Although the on-site method is the most preferred and the photographic method seems best suited for use under laboratory conditions, a written site description would be a better alternative in studies using a mailed questionnaire because photographic duplication costs would be prohibitive in even a small survey. The written description would be less costly than either the on-site or photographic methods and would work well if the descriptions could accurately portray the setting and the variables which respondents would evaluate. A potential problem with the written method is that the description of a particular scene might be perceived in "the mind's eye" less consistently than if photographic or on-site methods were used. It might also be difficult for respondents to perceive the sizes and dimensions of objects without some form of visual representation.

Literature Review

Although there is no literature comparing methods to measure visitor perceptions of impacts at wilderness campsites, a number of studies dealing with landscape assessment have compared the use of

photographic simulations to on-site evaluations (Coughlin and Goldstein, 1970; Zube et al., 1974; Dunn, 1976; Boster and Daniel, 1972; Daniel and Boster, 1976; Schaffer and Richards, 1974; Shuttleworth, 1980). The majority of this work has been environmental perception research to measure preferences for landscapes or other natural and man-made features, and methods have included on-site evaluations and other forms of visual representation (e.g., photographs and sketches). No studies have used written representations.

On-Site and Photographic Comparisons

A pioneer study comparing on-site and photographic methods for measuring landscape preferences was conducted by Coughlin and Goldstein (1970). They used single photographs of various landscapes in an attempt to determine (1) whether people react differently when they evaluate a specific environmental site for specific uses than when they judge the overall aesthetic quality of the site, and (2) whether the judges' reactions to the photographs were similar to their reactions to the actual field settings. The study used color photographs and slides to compare the reactions of observers who viewed photographs with the reactions of those who viewed the same sites in field. The study concluded that there was no significant difference on the attractiveness regardless of who was responding to the photo. An attempt was also made to determine whether respondents viewed photographs and slides in the same manner as they viewed the real world environment. Results showed that there was little significant difference between the view of the real world and the same view using photographs and slides.

Zube et al. (1974) compared evaluations made by observers who viewed eight scenic panoramic photographs of rural landscapes to evaluations made by different observers of the same landscapes in the field. Subjects were asked to describe the overall scenic quality of each landscape by using a series of semantic scales (e.g., beautiful to ugly) and to rank-order the eight scenes from highest to lowest scenic quality. Respondents were also asked to assess the effect of specific landscape features (e.g., hills, fields, and streams) on scenic quality. The authors concluded that, in general, photographs and field observations were highly associated when dealing with the overall scenic quality of the landscape but when dealing with the perception of specific features within the landscape photographs were found to be less reliable than field observations.

Dunn (1976) evaluated the effectiveness of using photographs in place of on-site evaluations to measure recreationists' preferences for six different landscape scenes. Respondents who viewed photographs were asked to show their preferences for the landscapes in rank order from most preferred to least preferred. The respondents were then asked to compare the site at which they were interviewed with those represented in five photographs. The interview site was not represented by a photograph. Dunn's intention was to indicate "crudely" the divergence between on-site preferences and the expressed preferences for photographs of the same sites. Out of six sites which were ranked, two showed significant differences between mean scores for on-site and photographic evaluations. Dunn's explanation of the difference at one site was that the mean of the photographic preference ratings was so low that the on-site ratings could not realistically be expected

to replicate it. The differences for the other site were attributed to certain attributes of the site which were not represented in the photograph and poor photo quality. The author concluded that photographs can be used to accurately portray the landscape quality of a site.

Boster and Daniel (1972) estimated scenic value for six areas, five of which had been altered by various tree harvesting methods. A sixth area, which had not been disturbed, was given a value of zero, with negative scores indicating areas liked less, and positive scores indicating areas liked more. The investigators showed students 25 slides of each area, and professionals 10 slides of each of the same areas. The responses of the two groups were significantly different. In order to test the validity of the photographic method, 27 students were taken into the field to view the same landscapes. The mean scores of the two evaluation techniques were not statistically different, leading the authors to conclude that using photographs to measure scenic value of altered landscapes was both valid and reliable.

In another study by Daniel and Boster (1976), a "random walk" procedure was developed to obtain representative photographs of study areas. Aesthetic ratings of on-site observers were compared with those of subjects viewing slides of the same area. The authors concluded that random photographic sampling can accurately represent scenic areas and elicit similar scenic quality evaluations.

Shaffer and Richards (1974) used color slides and photographs to evaluate viewer reactions to 8 outdoor scenes. The reactions to the slides and photographs were then compared to on-site evaluations of the same 8 scenes. The overall results of the study suggested that when

color photographs or slides accurately depict most of the variation of natural and man-made environments, the responses to the photographic presentations agree favorably with similarly measured on-site responses to the same scenes.

Shuttleworth (1980) also examined the extent to which photographs of landscapes provoke responses which replicate responses to the landscapes themselves. Twelve scenic landscapes were assessed in the field and by black/white and color print photographs presented on 5" x 7" enlargements. Respondents were divided into groups and half viewed 6 scenes in one area and half viewed 6 scenes in another area. In the laboratory, half of the respondents examined black/white photographs of the same 6 views they saw in the field. In order to remove bias due to order of presentation, some students examined photographs first, while the rest completed their field questionnaires first.

There were significant differences between the reactions to and perceptions of landscapes viewed in the field or as photographs, but the author notes that the differences can be explained by content of the different presentation media. Also, the color photographs were better representations of field scenes than black/white photographs and therefore related more closely to field responses. Shuttleworth concluded that photographs could be used as surrogates for on-site evaluations in landscape studies, provided that the photographs were in color and used a wide angle lens to provide "the lateral and foreground context in each scene without distorting the actual scale relationships that are found in the direct perception of landscapes."

The studies described above all provide evidence that scenic quality evaluations based on photographs are similar to ratings made

in the field. Based on this work, other studies which deal with landscape assessment have simply assumed photographs or slides are reasonable substitutes for on-site evaluations (Buhyoff et al., 1978; Carls, 1974; Zube, 1973). Studies have also been conducted that use photographs to measure people's perceptions of environmental landscapes which have been altered by impacts such as insect infestation, power transmission lines, degredation caused by air pollution, and damage adjacent to highway corridors (Buhyoff and Leusetner, 1978; Buhyoff et al., 1979; Jackson et al., 1978; Latimer, 1979; Evans and Wood, 1980).

Perception Studies Related to Recreation

There is a general consensus that color photographs can accurately represent landscapes in evaluation and preference research. However, these studies have focused on evaluations of large-scale landscapes. Few have explored evaluations of smaller-scale, more specific features such as the wilderness campsite characteristics under investigation in the present study.

A study by Nieman and Futrell (1979) is an exception. It explored user perceptions of disturbance levels at recreation areas using 3 x 5 inch color photographs of recreation scenes. Respondents were shown the photographs and asked to evaluate the scene in terms of the amount of disturbance felt when viewing the photo. The photographs focused on four issues: (1) levels of perceived crowdedness; (2) the presence of man-made elements in the immediate vicinity of the recreation experience (e.g., restrooms); (3) the influence of man's

actions on the landscape (e.g., worn trails); and (4) the incidence of man-made elements in the viewing area (e.g., viewed from an overlook). The sample consisted of 3 groups: (1) hikers, (2) picnickers, and (3) junior and senior landscape architecture students (who were not utilizing the area at the time of testing but are trained to understand aesthetic quality).

The authors concluded that in general disturbance levels increase as the incidence of disturbance elements increases. Hikers appeared to be more disturbed than the other two groups only in regard to levels of crowdedness. Landscape architecture students appeared more disturbed than hikers or picnickers by worn and eroded trails and by the presence of man-made elements in the immediate vicinity. For incidence of man-made elements in the viewing area there were no statistically significant differences among groups.

The authors hypothesize that hikers were relatively undisturbed by the worn trails because they had come to the area to utilize the trails and it was not likely that they would be greatly bothered no matter how worn or eroded the trails appeared (61% of all respondents were not disturbed by the worn trails). Although there were no comparisons with field evaluations in this study, results appear compatible to those of Helgath's (1975) field study which found that 70% of the people sampled said they were well satisfied with the trails, even though some were severely eroded and over-used.

In summary, previous studies using photographs for assessment purposes have generally emphasized assessment of landscape features in general; only Nieman and Futrell (1979) explored evaluations of specific types of recreational impacts. Even in this case, the evaluation of

those impacts was a general measure of the respondent's disturbance regarding the impact present in a particular scene.

There are three main differences between previous studies and the present study. First, the present study focuses on visitor evaluations of specific environmental impacts rather than an entire scene or landscape. Second, the present study evaluated settings on a smaller scale than previous studies. Third, no other studies have tried to establish evaluative standards for the acceptability of a level of impact.

The present study measures visitor evaluations of specific ecological impacts at wilderness campsites using site visits, color photographs and written descriptions. The study hypothesizes that evaluations based on these three methods will not differ significantly.

METHODOLOGY

This research project was designed as a field study using a combination of structured interviewing and formal conversation with respondents. All data were obtained under field conditions in the Mt. Jefferson Wilderness, Oregon during July, August, and September of 1981. The study population consisted of people 16 years or older who camped at least one night in either of the study areas. Day users were not included because campsites are of less importance to this type of user.

The Mt. Jefferson Wilderness is situated along the crest of the Oregon Cascades about 60 miles east of Salem, 100 miles southeast of Portland, and 70 miles northwest of Bend (Figure 1). Its central location to population centers of the Willamette Valley and Eastern Oregon makes it a popular recreation site. The 100,208 acre wilderness is about 38 miles long, 17 miles wide, and dominated by 10,497 foot Mt. Jefferson. The variety of wilderness features includes alpine meadows, tranquil lakes, rushing streams, sweeping expanses of forest, and rugged terrain which consists of lava flows, ice, and snow. About 87% of the wilderness has vegetative cover, and 62% is covered with timber. The area offers a variety of recreation opportunities including hiking, climbing, horse riding, fishing, and hunting. Although access is difficult from November until June due to snow accumulation, winter use has also seen a continuing increase

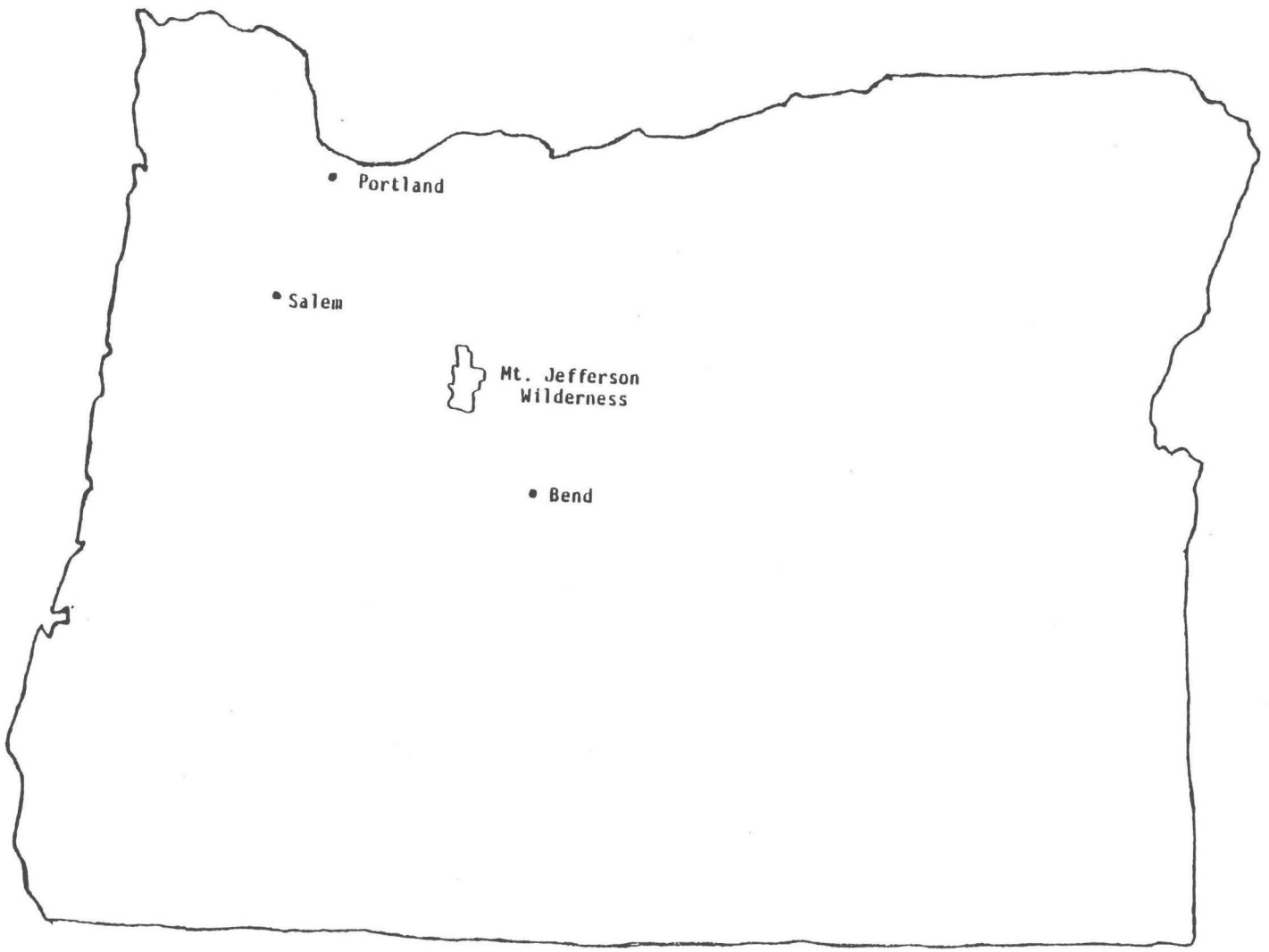

Figure 1. Location of Mt. Jefferson Wilderness in Oregon

in recent years. During the 1981 use season (June 15 to November 15) the area received approximately 89,000 visitor days of use, making Mt. Jefferson second to Mt. Hood Wilderness for visitor days per acre in Region Six.

Study Areas

Two areas within the wilderness were selected for study. The idea was to select one area where visitors had a wide range of experience levels (novice to very experienced) and one area visited by both hikers and horse riders. Visitor statistics for the 1979-1980 seasons showing total number of visits and method of travel for areas within the wilderness were examined. The overall experience level of visitors to specific areas was a judgmental decision based on discussions with the area resource manager and information provided by the interviewer, who had spent two summer seasons observing visitors and use patterns while employed as a wilderness guard.

Based on the above criteria, two high use areas were selected for the location of study sites. Jefferson Park is just north of the base of Mt. Jefferson (see Figure 2). It is easily accessible from four trailheads, and is characterized by long grassy reaches and wildflower meadows broken by small lakes and clumps of Mountain Hemlock, Noble Fir, and Pacific Silver Fir. Use statistics show that 896 parties visited Jefferson Park in 1981, accounting for 2,624 people hiking and 26 people using pack and saddle stock. Four sites at Scout Lake and three at Bays Lake were selected for bare ground

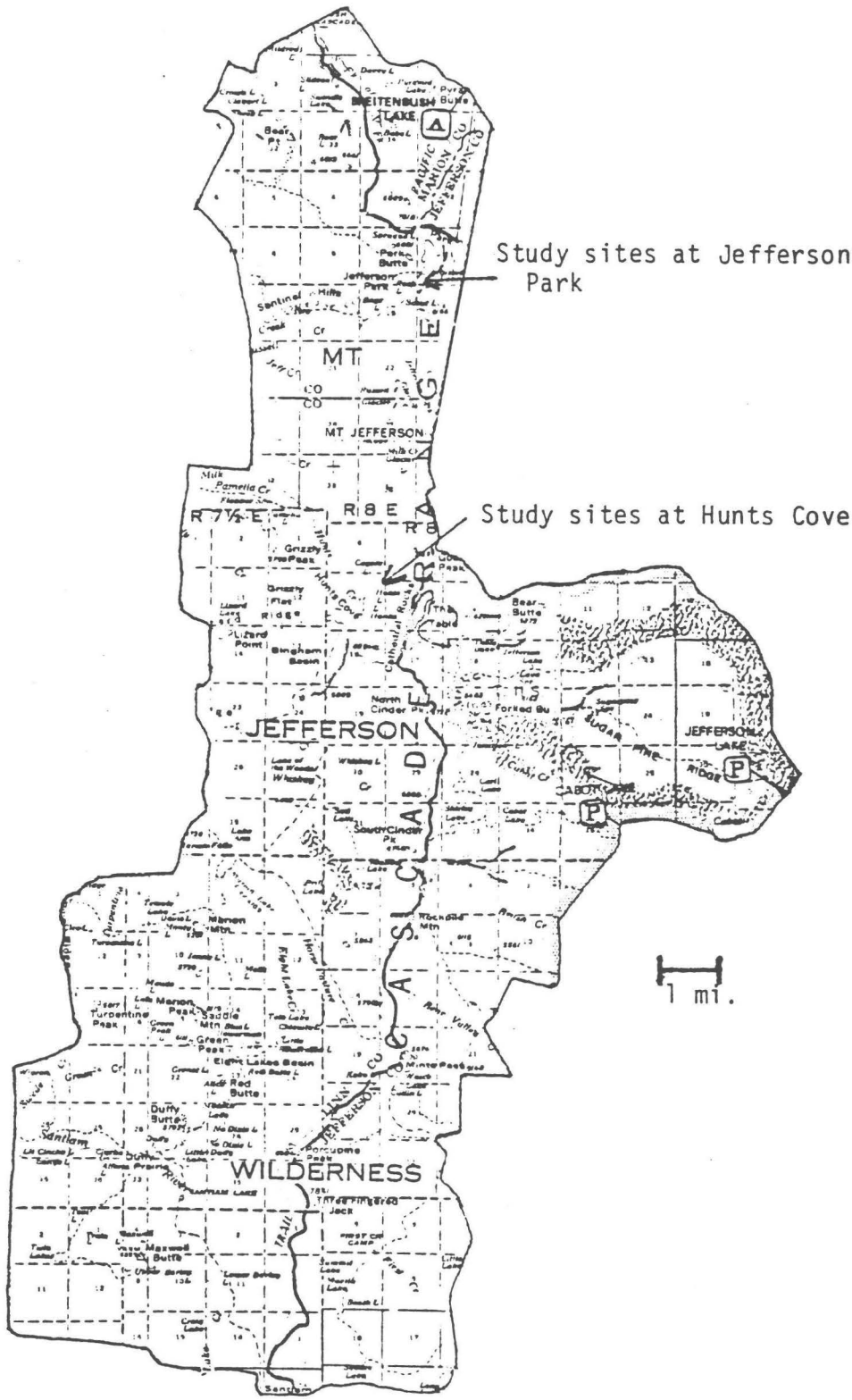

Figure 2. Location of Study Areas Within the Mt. Jefferson Wilderness

evaluation. Four sites at Russell Lake were selected for fire ring evaluation (see Figure 3).

Hunts Cove is just south of the base of Mt. Jefferson (see Figure 2). Rock slopes ring the basin on three sides, and natural springs meander through subalpine meadows located around Hunts and Hanks Lakes. The area is easily accessible from two major entry points into the wilderness. Use statistics show that approximately 600 parties visited the area in 1981, accounting for 1800 people hiking and 142 using pack and saddle stock. The area is particularly appealing to hunters in the fall. Nine sites were selected at Hunts Lake, five for bare ground evaluations and four for fire ring evaluations (see Figure 3).

Study Sites

Campsites were selected to represent (1) varying degrees of bare ground, and (2) different size and appearance of fire rings. A total of twenty campsites were chosen, twelve for bare ground and eight for fire rings. At Jefferson Park, respondents evaluated four fire ring sites, four bare ground sites, or three bare ground sites. At Hunts Cove they evaluated four fire ring sites or five bare ground sites. Site selection criteria were: (1) close proximity to one another so that walking time for respondents evaluating a particular group of sites could be minimized; (2) obvious gradations of the impact being evaluated; and (3) control (as best as possible) for such characteristics as view of scenic features, proximity to water, and suitability of tent spot. Once sites were selected, modifications were performed

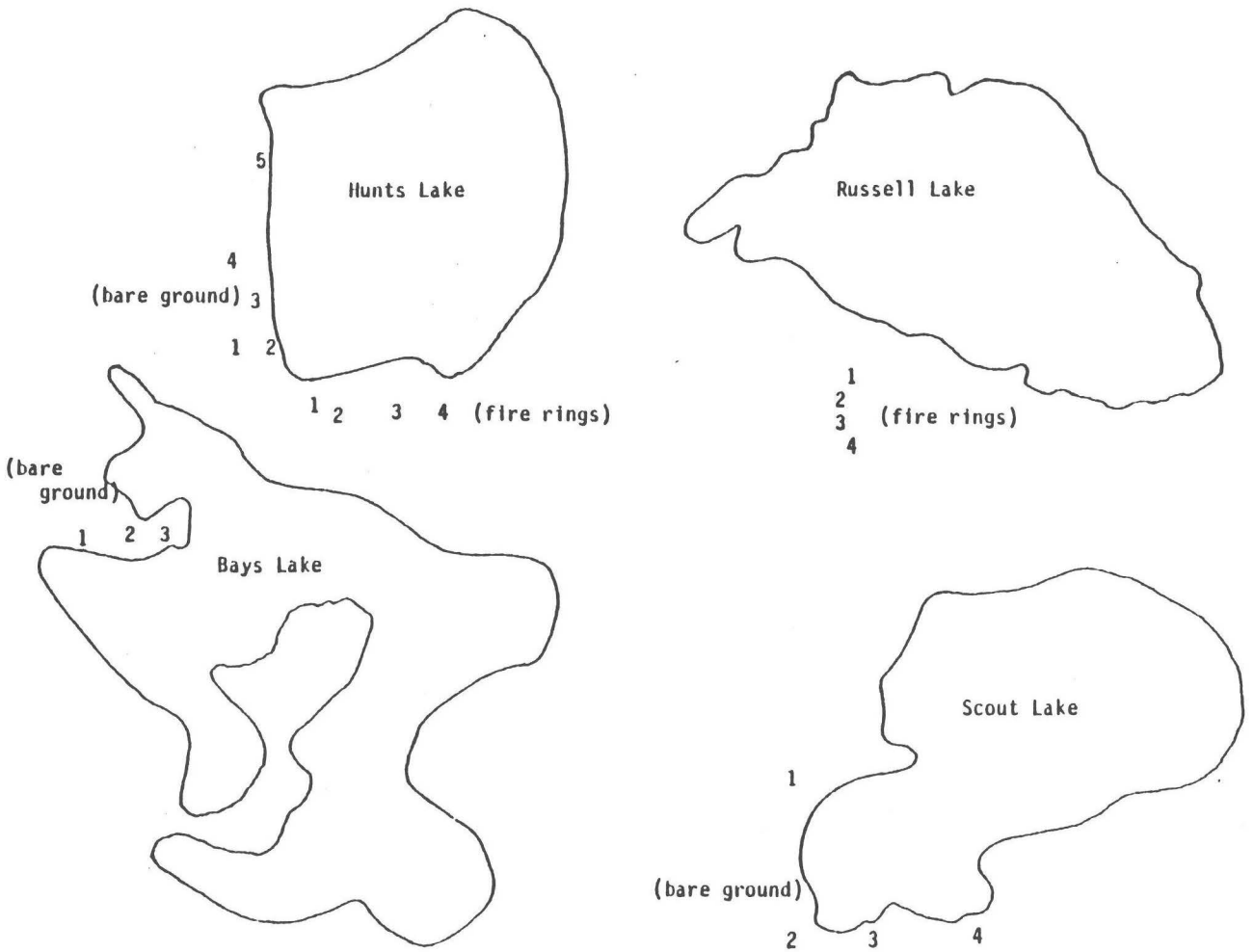

Figure 3. Location of Individual Study Sites

where necessary. In some instances fire rings had to be constructed or modified by adding rocks, charcoal, and small amounts of litter. At campsites where bare ground was being evaluated, fire rings were removed to keep other impact variables from entering into the evaluation.

Next, 35mm color slides were taken of each site. The researcher was shown in each photo to provide a reference of scale. A 28mm wide-angle lens was used in order to accurately portray size and detail of each site. Other studies which have used wide-angle photography have found no distortion of the actual scale relationships when compared to the actual on-site view of the same area (Shuttleworth, 1980; Buhyoff et al., 1979). Once sites had been photographed they were closed to public use to insure that the sites were not tampered with in any way.

After judging all slides, three 5 x 7 inch enlargements were made for each site (see Appendix A). The first was an overview of the campsite which emphasized background and foreground features such as overstory, understory, proximity to lake or trail, and as much of the view as possible. The second was a general view which eliminated background features and focused on the site itself. A third focused specifically on the type of impact (bare ground or fire ring) being evaluated.

Written descriptions were then developed. The descriptions needed to be detailed in order to convey characteristics of the site such as view, size, distance to water, proximity from other sites, and specific impacts, but length was a concern because too much information might overwhelm and confuse respondents. Because of this,

a general description was written to describe the location of all the sites being evaluated by a particular respondent. Following the general description, each individual site was described in one or two short paragraphs which explained the size of the site, proximity to other camps, shelter, type and amount of surrounding vegetation, and type and size of impact. Written descriptions are presented in Appendix B.

Survey Instruments

Two questionnaires were used to collect data. Questionnaire number one asked about physical characteristics important when selecting a campsite, backcountry experience, and demographic information. Questionnaire number two asked about respondents' general reactions to the campsite being viewed, the acceptability of the impact in question, the overall desirability of the campsite as a place to camp, and the overall ranking of campsites in order to preferences. The questionnaire for fire ring evaluations contained additional questions about what respondents used campfires for and whether or not they carried stoves.

Data Collection and Sampling

Respondents were contacted by the researcher and asked to participate in the study. A total of 450 persons were contacted and 427 agreed to participate (15 chose not to participate due to

inclement weather and eight due to lack of time), for a response rate of 95%.

At each individual study location 30 respondents were selected to use each measurement method, making a total of 90 respondents contacted at each of the five study locations. Respondents were given questionnaire number one (see Appendix D) to complete before evaluating the campsites. This gave the researcher time to informally chat with respondents and answer any questions pertaining to the nature of the study.

In some instances more than one person per party expressed an interest in participating in the study. When this occurred, no more than two persons from any one party were allowed to participate. If more than two persons expressed interest they were asked to select a number between one and six. A die was then rolled and the first two party members whose numbers corresponded with those on the die were allowed to participate. Only two members from each party were allowed to participate to minimize the possibility of response bias due to party members conversing about the evaluations.

After completing questionnaire one, each respondent evaluated three to five campsites in one location. Each respondent evaluated only one kind of impact, using only one of three measurement methods. After familiarizing themselves with the method being used, respondents were asked to talk about their general feelings about the site itself. The researcher wrote down the responses of each respondent. For on-site evaluations a list of responses which had been compiled from pre-testing were used when respondents discussed their general feelings about the site. These were checked by the researcher when

mentioned by the respondent (see Appendix D). Next, respondents were given a card which contained five-point scales regarding the desirability of the site as a place to camp and the acceptability of the impact in question (see Appendix D). Finally, respondents were asked to rank the sites in order of preference as a place to camp.

On-site evaluations were completed before any photographic or written evaluations were conducted. This minimized the time any one site had to remain closed and decreased the chances of a party camping at or modifying a closed site. To randomize the order in which sites were evaluated, a die was rolled to select the sequence in which evaluations would take place. Visitors were then taken to individual sites by the researcher and asked to respond to questions which were presented in an interview format. The time for each interview was approximately 25 minutes.

Photographic evaluations were conducted in approximately the same manner as on-site evaluations except that respondents generally remained at their own campsites, which made the interview time shorter (approximately 15 minutes). If two respondents from the same party were participating, they evaluated different types of impacts.

Photographs were arranged in a notebook and sites were viewed by the respondent in a randomized order. Photographs depicting the overview and site in general were on one page and viewed first. The photograph showing the specific impact being evaluated was located on an adjacent page and was viewed separately from the other photos.

Written evaluations were also conducted at the respondent's campsite. The order in which respondents read evaluations was also randomized by rolling a die. The respondents were handed an 8½ x 11 inch sheet of paper containing the written descriptions of all sites to be evaluated. After reading the general description, the respondent was directed to the site being evaluated and asked to read the description. The respondent then answered the questions asked by the interviewer. The time for a written evaluation was approximately 15 minutes.

RESULTS

The results of the study reveal information about: (1) differences between the three measurement methods; (2) evaluative standards for bare ground and fire rings; (3) physical characteristics and site selection; (4) differences between hikers and horse riders; and (5) demographic characteristics of visitors.

Differences Between Measurement Methods

Five areas were used for evaluating bare ground and fire rings at campsites. The three measurement methods were compared at all areas to see if any significant differences existed ($p \leq .05$). Items used for these comparisons included acceptability of impact, desirability of the site as a place to camp, and the rank order of preference for each site. Results were analyzed using an analysis of variance F-test which compared differences between means for the three methods. When the F-test indicated overall significance, the Student-Newman-Keuls a posteriori contrast test was used to determine which sets of means differed significantly (Nie et al., 1975).

Acceptability Ratings for Specific Impacts

The results presented in Table 1 show that at 8 of 12 campsites (66%) used for evaluating bare ground no significant differences

Table 1. Acceptability[a] Ratings for Specific Impacts

Site	Mean Scores: On-Site 1	Photographic 2	Written 3	F Value	SNK[c]
Scout Lake Bare Ground					
Site 1	1.47	1.75	1.32	1.71	NS
Site 2	2.27	2.17	2.54	1.82	NS
Site 3	3.20	3.46	3.71	2.50	NS
Site 4	4.60	4.63	4.61	.01	NS
Bays Lake Bare Ground					
Site 1	1.33	1.24	1.42	.60	NS
Site 2	3.90	2.70	3.92	21.04[b]	2<3&1[d]
Site 3	4.33	4.40	4.40	.04	NS
Hunts Lake Bare Ground					
Site 1	2.60	3.24	2.30	5.38[b]	2>1&3[d]
Site 2	4.31	4.12	3.70	3.02[b]	3<2&1[e]
Site 3	3.80	2.80	2.44	.57	NS
Site 4	1.62	1.72	1.83	.22	NS
Site 5	1.41	1.92	2.21	13.78[b]	3>1[e]
Russell Lake Fire Ring					
Site 1	1.51	1.90	2.23	2.51	NS
Site 2	3.40	3.00	2.50	6.12[b]	3<1[e]
Site 3	1.40	1.45	1.33	.13	NS
Site 4	4.70	4.41	4.70	1.93	NS
Hunts Lake Fire Ring					
Site 1	1.64	1.50	1.26	1.41	NS
Site 2	2.12	2.20	1.80	.62	NS
Site 3	3.72	3.16	3.52	2.26	NS
Site 4	3.72	3.90	4.60	4.71[b]	3>2&1[e]

[a] Based on a scale of 1 = Totally Acceptable, 2 = Somewhat Acceptable, 3 = Neutral, 4 = Somewhat Unacceptable, 5 = Totally Unacceptable

[b] $p \leq .05$

[c] This column indicates which sets of means were significantly different, based on the Student-Newman-Keuls (SNK) test

[d] Methods 1 and 2 are significantly different

[e] Methods 1 and 3 are significantly different

between methods were found. At Scout Lake no differences were found between methods at any sites. At Bays Lake differences were found at site 2 between the photographic method and the on-site and written methods (2.70 vs. 3.90 and 3.92, respectively). At Hunts Lake differences were found between methods at sites 1, 2, and 5. At site 1 the photographic method was significantly different than the on-site and written methods, but for sites 2 and 6 the written method was significantly different from the other two.

Results presented in Table 1 for the acceptability of fire rings show that at 6 of 8 campsites (75%) there were no significant differences between methods. At Russell Lake differences were found at site 2 between written and on-site methods (2.50 vs. 3.40, respectively). At Hunts Lake differences were found at Site 4 between the written method and on-site and photographic methods (4.60 vs. 3.72 and 3.90, respectively).

In general, then, there were few differences between methods when rating specific impacts. Overall, there were no significant differences at 14 out of 20 sites (70%). At the six sites where differences did occur, two showed differences between the photographic and on-site methods and four showed differences between the written and on-site methods. In other words, the photographic method agreed with site evaluations at 18 out of 20 sites (90%), and the written method agreed with site evaluations at 16 out of 20 sites (80%).

Desirability Ratings for Sites Overall

Although specific impact evaluations produced few differences between methods, there was a greater number of significant differences

when overall desirability ratings were compared. Table 2 shows that there were significant differences between methods at 13 of the 20 sites (65%). At these 13 sites where differences occurred, five showed differences between the photographic and on-site methods and seven showed differences between the written and on-site methods. In other words, the photographic method agreed with site evaluations at 15 out of 20 sites (75%), and the written method agreed with site evaluations at 13 out of 20 sites (65%).

Preference Rankings for Sites Overall

As with desirability ratings, the general preference rankings show greater divergence between the on-site and other evaluation methods. Table 3 shows that there were significant differences between methods at 12 of the 20 sites (60%). At these 12 sites where differences occurred, five showed differences between the photographic and on-site methods and four showed differences between written and on-site methods. In other words, the photographic method agreed with site evaluations at 15 out of 20 (75%) sites and the written method agreed with site evaluations at 16 out of 20 sites (80%).

Evaluative Standards

Although this research was designed to compare measurement methods, the data also allow us to explore evaluative standards for the impacts in question (bare ground and fire rings). Following Vaske (1978), Shelby (1981), and Shelby and Heberlein (1982), average

Table 2. Desirability[a] Ratings for Sites Overall

Site	Mean Scores: On-Site 1	Photographic 2	Written 3	F Value	SNK[c]
Scout Lake Bare Ground					
Site 1	3.07	2.50	2.04	5.52[b]	1>3[e]
Site 2	1.93	1.80	2.20	2.96	NS
Site 3	2.33	2.60	2.93	2.10[b]	3>1[e]
Site 4	3.80	3.92	4.10	.58	NS
Bays Lake Bare Ground					
Site 1	2.52	2.14	2.54	1.44	NS
Site 2	2.74	2.30	3.23	4.13[b]	3>2
Site 3	3.00	3.34	3.54	1.17	NS
Hunts Lake Bare Ground					
Site 1	2.10	2.32	2.10	.67	NS
Site 2	3.93	3.20	3.40	2.94	NS
Site 3	3.63	2.92	2.52	8.81[b]	1>2&3[de]
Site 4	2.91	2.44	3.24	3.81[b]	3>2
Site 5	1.75	2.20	2.40	4.43[b]	3>1[e]
Russell Lake Fire Rings					
Site 1	2.50	1.93	2.43	4.24[b]	2>1[d]
Site 2	3.03	2.41	2.43	5.20[b]	1>2[d]
Site 3	2.60	1.90	2.53	6.31[b]	1>2[d]
Site 4	4.00	3.20	3.30	7.17[b]	1>3[e]
Hunts Lake Fire Rings					
Site 1	2.52	2.13	2.81	4.13[b]	3>2
Site 2	1.84	1.83	2.50	5.10[b]	3>2&1[e]
Site 3	3.60	2.40	3.00	11.38[b]	1>2&3[de]
Site 4	2.60	2.60	2.44	.12	NS

[a] Based on a scale of 1 = Very Desirable, 2 = Somewhat Desirable, 3 = Neutral, 4 = Somewhat Undesirable, 5 = Very Undesirable

[b] $p \leq .05$

[c] This column indicates which sets of means were significantly different, based on the Student-Newman-Keuls (SNK) test

[d] Methods 1 and 2 are significantly different

[e] Methods 1 and 3 are significantly different

Table 3. Preference[a] Rankings for Sites Overall

Site	Mean Scores: On-Site 1	Photographic 2	Written 3	F Value	SNK[c]
Scout Lake Bare Ground					
Site 1	2.90	2.46	1.93	5.27[b]	1>3[e]
Site 2	1.70	1.50	1.70	1.80	NS
Site 3	2.33	2.50	2.44	.67	NS
Site 4	3.70	3.54	3.86	3.21[b]	3>2
Bays Lake Bare Ground					
Site 1	2.00	1.80	1.53	1.63	NS
Site 2	1.73	1.40	1.80	4.90[b]	3>2
Site 3	2.30	2.82	2.70	5.23	2>1[d]
Hunts Lake Bare Ground					
Site 1	2.28	3.40	2.30	6.26[b]	2>3&1[d]
Site 2	4.71	4.28	4.29	1.82	NS
Site 3	3.69	3.20	3.11	2.62	NS
Site 4	2.71	2.32	2.90	1.96	NS
Site 5	1.72	1.84	2.46	3.13	NS
Russell Lake Fire Rings					
Site 1	2.10	2.24	2.73	4.80[b]	3>2&1[e]
Site 2	2.52	2.21	1.80	6.45[b]	3<1[e]
Site 3	1.71	1.60	1.73	1.79	NS
Site 4	4.00	4.00	3.80	3.90[b]	3<2&1[e]
Hunts Lake Fire Rings					
Site 1	2.52	2.10	2.92	6.71[b]	3>2
Site 2	1.60	2.33	2.25	4.01[b]	1<2[d]
Site 3	3.44	2.80	3.00	3.07[b]	1>2[d]
Site 4	2.50	2.83	1.90	6.00[b]	2>3&1[d]

[a] Figures correspond to order in which site was preferred.

[b] $p \leq .05$

[c] This column indicates which sets of means were significantly different, based on the Student-Newman-Keuls (SNK) test

[d] Methods 1 and 2 are significantly different

[e] Methods 1 and 3 are significantly different

acceptability ratings were plotted for the different impact levels represented at each study location. It is thus possible to see where these impacts become unacceptable to visitors. Standard deviations give some measure of the agreement among visitors (norm crystalization).

Evaluative Standards for Bare Ground

Evaluative standards for bare ground can be developed from data collected at Scout Lake, Bays Lake, and Hunts Lake. Because dimensions of bare ground areas varied, each location is plotted separately.

A graphic representation of respondents' perceptions of bare ground for the four campsites at Scout Lake is shown in Figure 4. For visitors sampled here (n=82), the amount of bare ground at a campsite exceeded acceptable limits somewhere between 1050 and 1800 sq. ft. By interpolation we can estimate the acceptable limit to be approximately 1500 sq. ft.

Figure 5 gives a graphic representation of respondents' perceptions of bare ground for the three campsites at Bays Lake. For Bays Lake respondents (n=86), the amount of bare ground exceeded acceptable limits somewhere between 156 and 928 sq. ft. (at approximately 700 sq. ft.).

At Hunts Lake five sites were evaluated. Figure 6 shows that acceptable limits for bare ground were exceeded between 672 and 1404 sq. ft. (at approximately 800 sq. ft.).

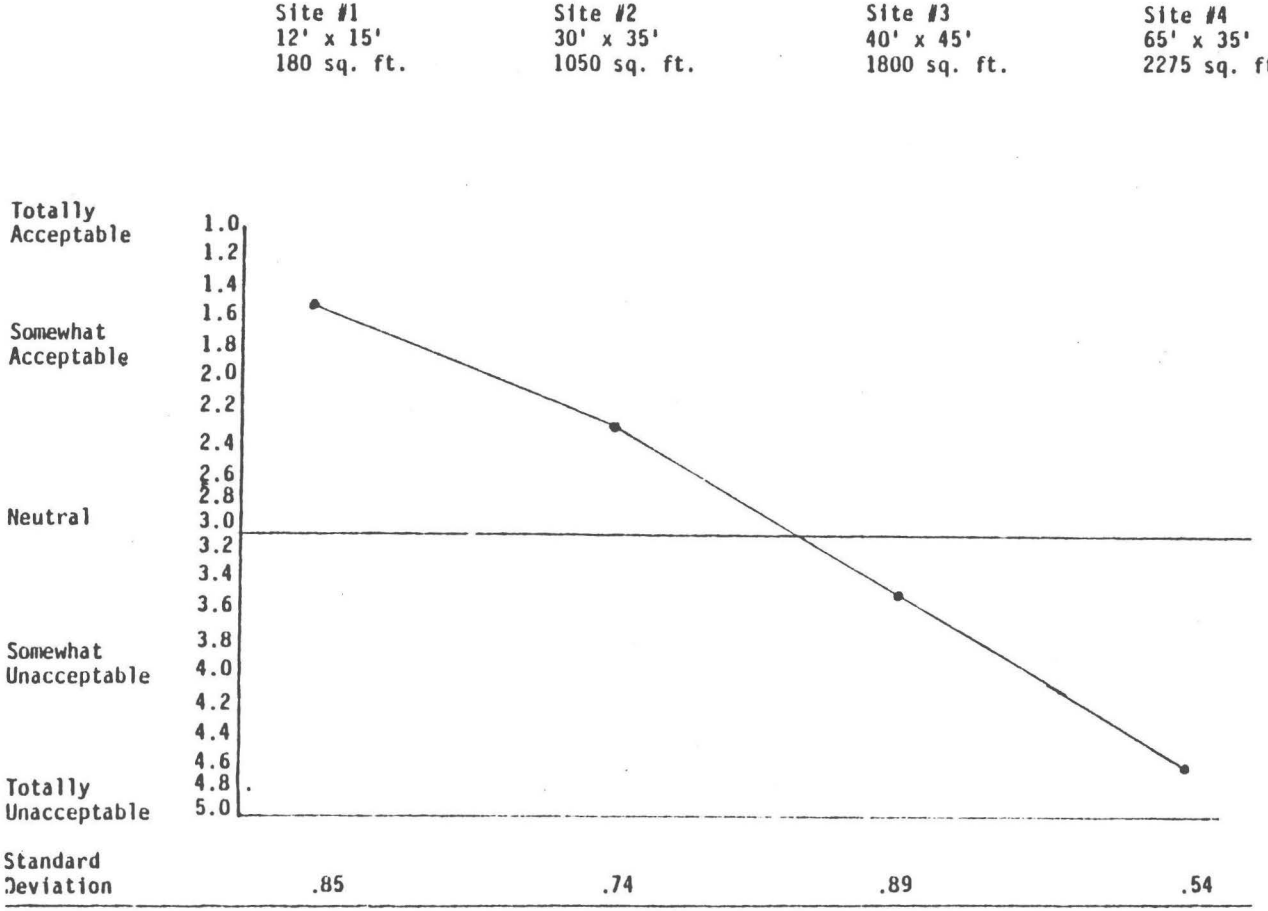

Figure 4. Scout Lake Bare Ground

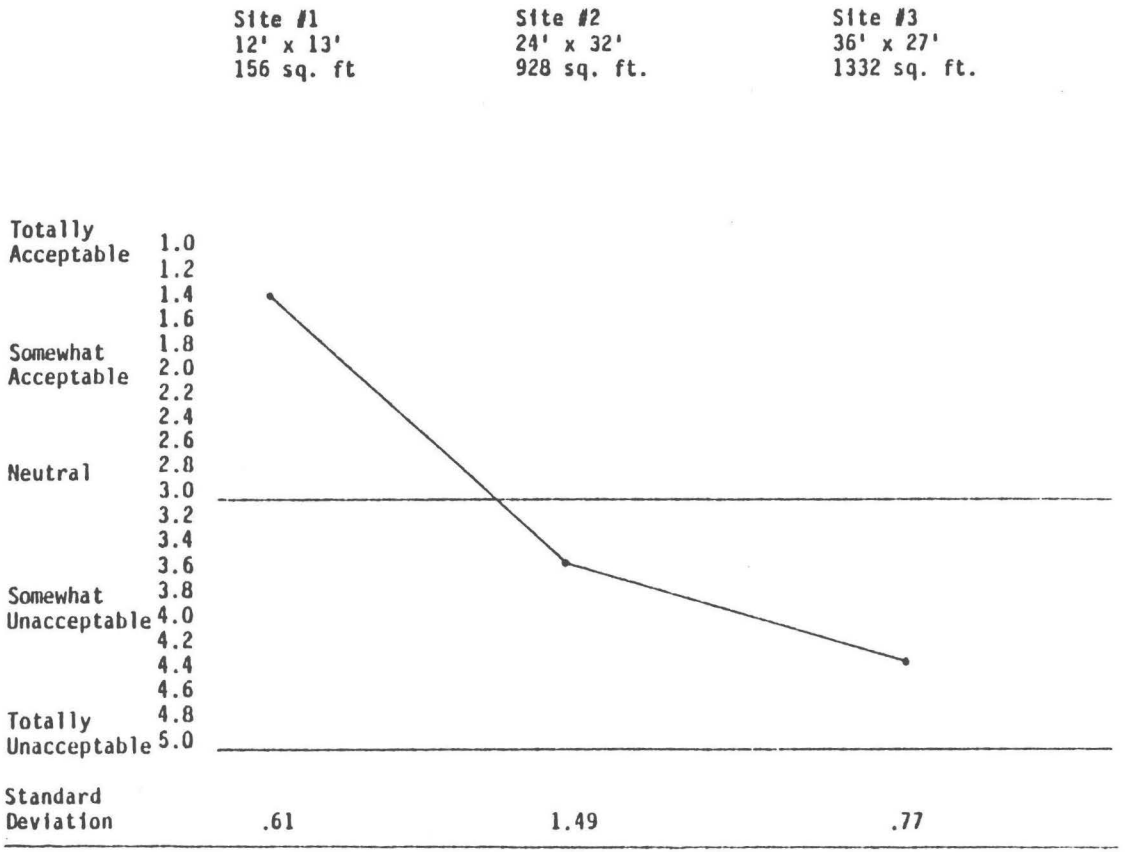

Figure 5. Bays Lake Bare Ground

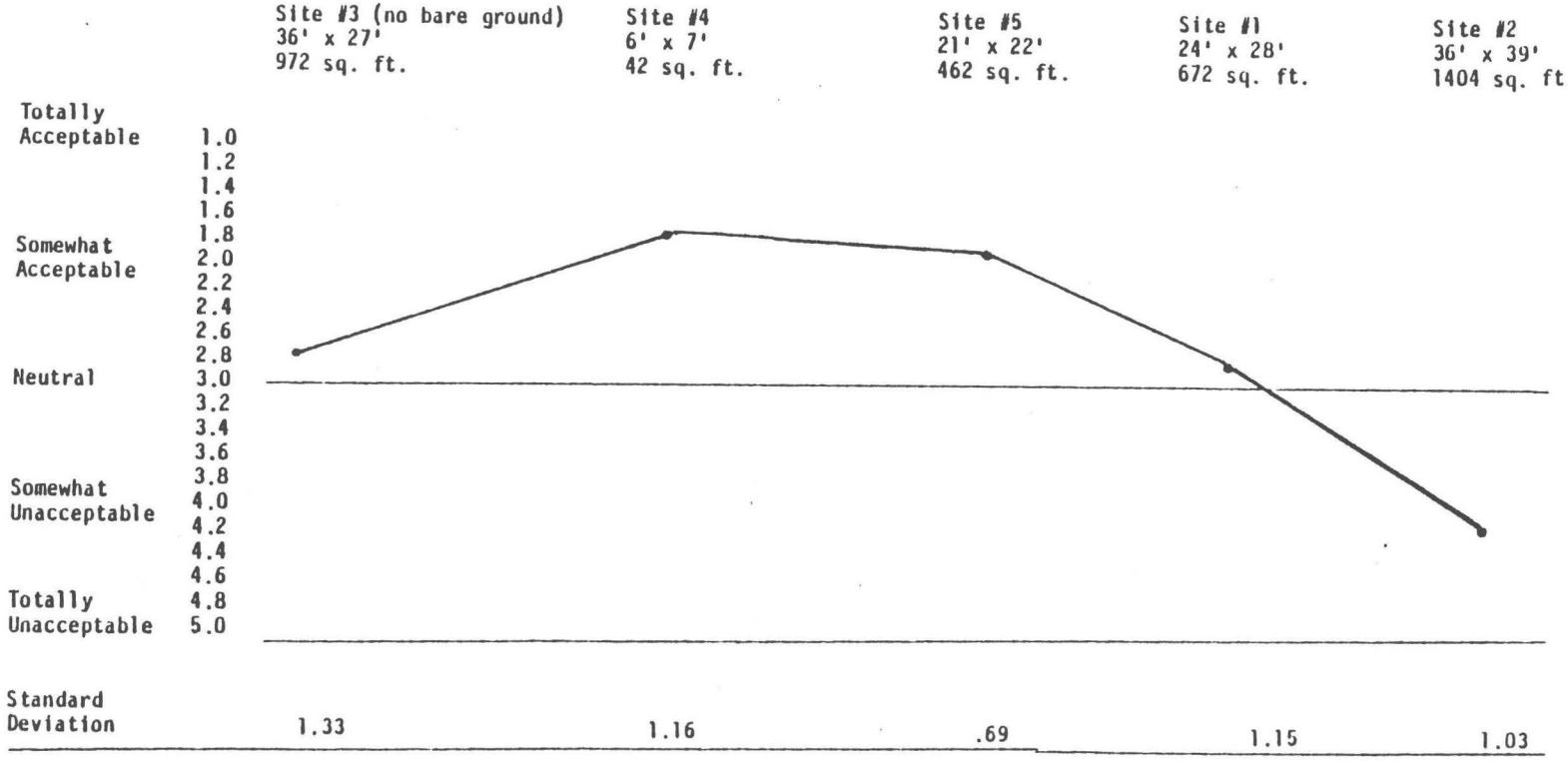

Figure 6. Hunts Lake Bare Ground

Evaluative Standards for Fire Rings

Evaluative standards for fire rings can be developed from data collected at Hunts Lake and Russell Lake. Because sizes of fire rings varied, each location is plotted separately.

At Hunts Lake, four fire rings were evaluated. Figure 7 shows that respondents here (n=83) found the size and appearance of a fire ring exceeded acceptable limits at 22 inches in diameter with large amounts of charcoal inside the firepit, and charcoal spreading onto the ground.

At Russell Lake four fire rings were evaluated. Figure 8 shows that respondents here (n=89) found the fire ring that was 36 inches in diameter with large amounts of charcoal, charred wood, and small bits of litter was not acceptable.

Physical Characteristics and Site Selection

Visitors participating in the study were asked an open-ended question about the features they considered important at each campsite they viewed. Their perceptions of physical characteristics at each campsite were recorded by the interviewer and a frequency distribution was generated for each campsite. Relative frequencies for the physical characteristics for each campsite are presented to show what characteristics were most often mentioned by respondents when they evaluated sites (see Table 4). For ease of presentation, categories were combined where appropriate (e.g., "too far from lake" and "too close

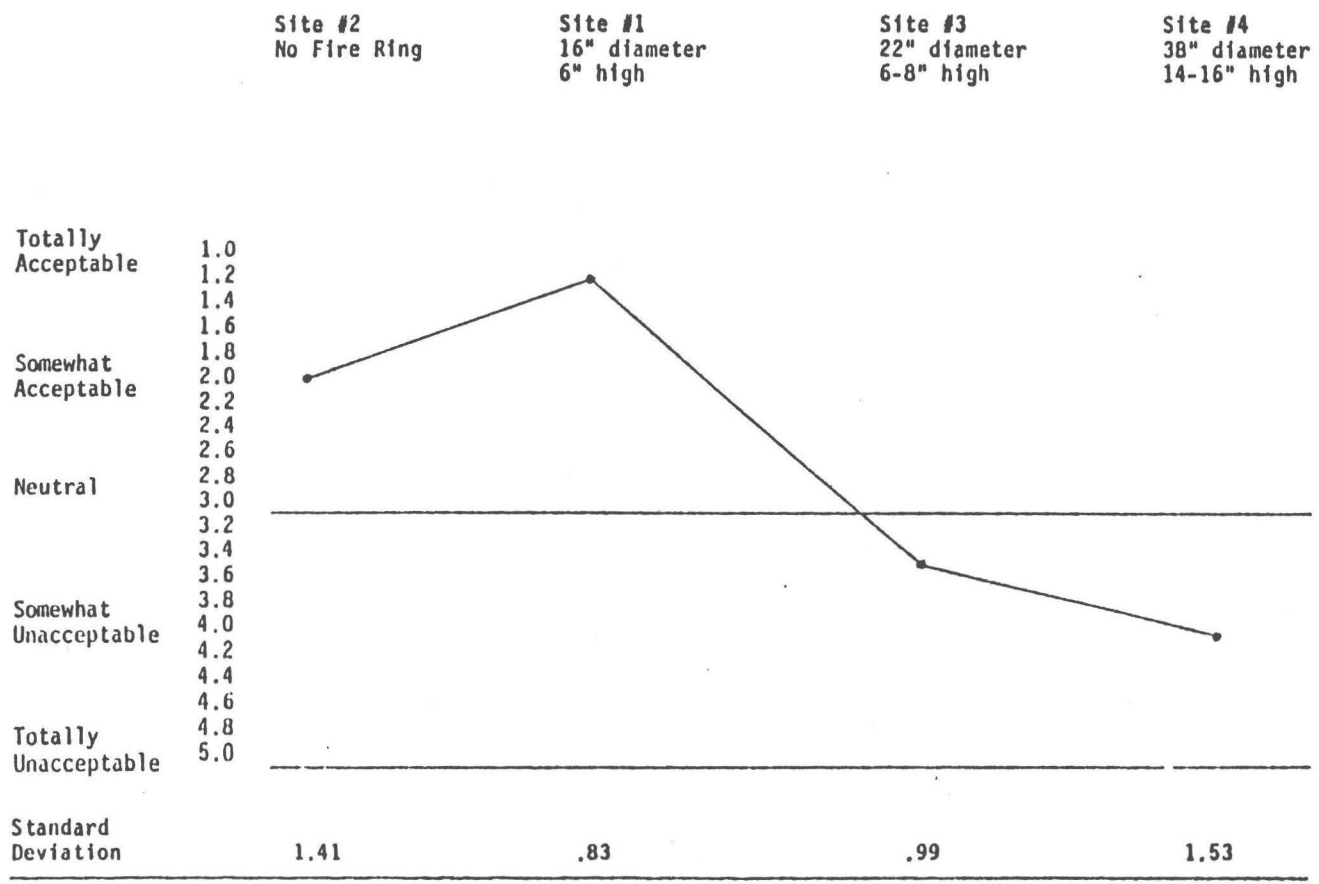

Figure 7. Hunts Lake Fire Rings

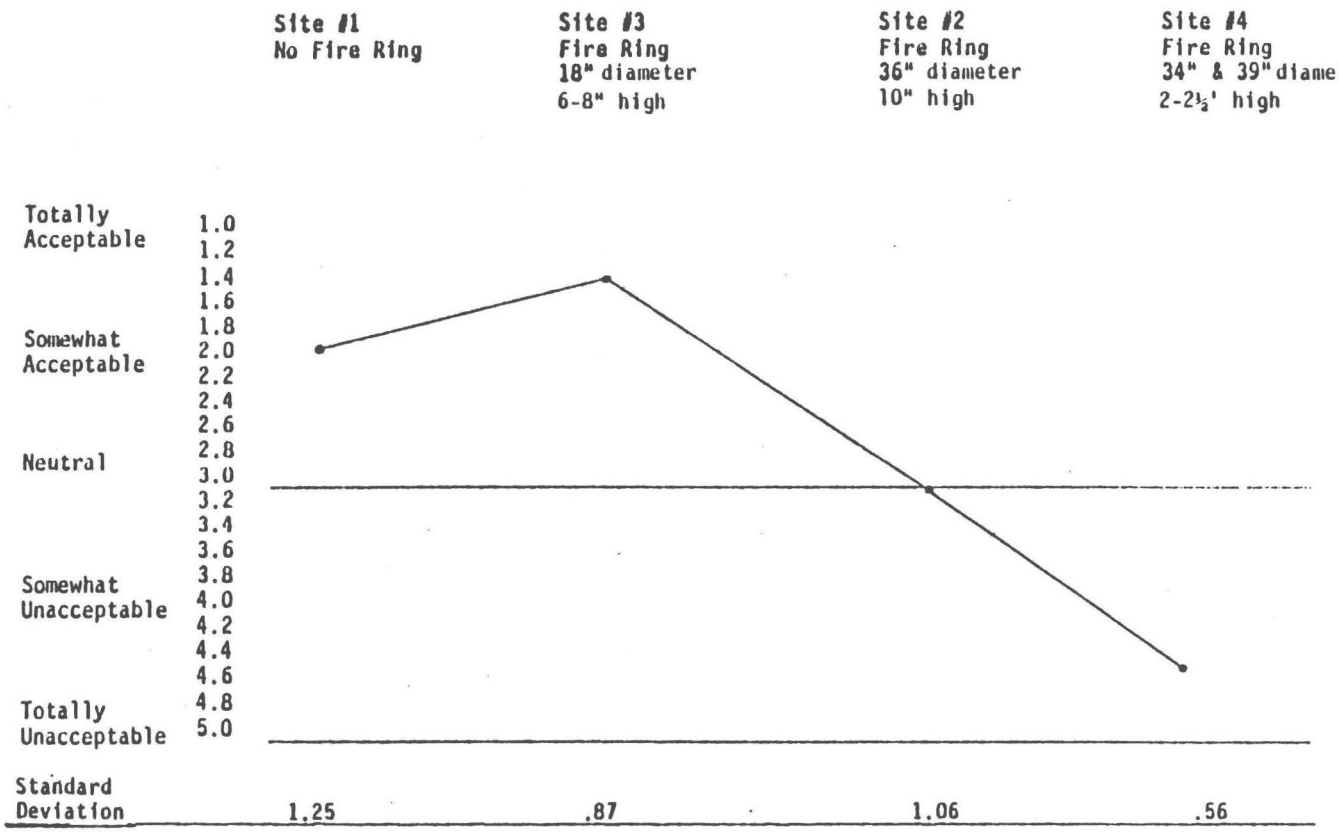

Figure 8. Russell Lake Fire Rings

Table 4. Physical Characteristics Mentioned at Each Site

Location & Physical Characteristics	1	2	3	4	5	Average
Scout Lake n=82 (bare ground)	Percent of Respondents					
1 View of Scenic Features	89	96	96	86		92
2 Quality of Tent Site	53	60	59	40		53
3 Size of Campsite	52	9	30	88		45
4 Proximity to Other Camps	51	33	15	65		41
5 Shelter from Weather	25	46	40	52		40
6 Distance from the Lake	29	30	25	44		32
7 Amount of Bare Ground	15	9	26	57		21
8 Distance from Fresh Water	25	21	18	21		17
Bays Lake n=86 (bare ground)						
1 Proximity to Other Camps	68	67	62			66
2 View of Scenic Features	50	76	57			61
3 Quality of Tent Site	54	53	44			50
4 Shelter from Weather	45	47	35			42
5 Size of Campsite	43	16	60			40
6 Distance from the Lake	38	40	37			38
7 Amount of Bare Ground	1	26	47			25
8 Distance from Fresh Water	0	0	0			0
Hunts Lake n=87 (bare ground)						
1 View of Scenic Features	85	77	77	84	83	81
2 Quality of Tent Site	57	59	52	71	66	61
3 Proximity to Other Sites	46	50	56	65	52	54
4 Shelter from Weather	37	35	35	36	54	39
5 Distance from Lake	19	51	36	45	46	39
6 Distance from Trail	29	21	40	48	23	32
7 Size of Campsite	22	45	34	14	5	24
8 Amount of Bare Ground	8	43	50	3	1	21
9 Distance from Fresh Water	0	0	0	0	0	0

Table 4 (Continued)

Location & Physical Characteristics	1	2	3	4	5	Average
	Percent of Respondents					
Hunts Lake n=83 (fire rings)						
1 View of Scenic Features	52	54	81	91		70
2 Shelter from the Weather	71	74	61	64		68
3 Quality of Tent Site	62	63	48	39		53
4 Rocks and Logs for Facilitation	10	66	48	72		49
5 Size of Fire Ring	60	26	46	59		48
6 Proximity to Other Camps	37	42	41	45		41
7 Distance from the Lake	48	48	36	17		37
8 Size of Campsite	6	5	39	12		16
9 Distance from Fresh Water	18	13	13	12		14
10 Amount of Bare Ground	8	4	2	4		5
Russell Lake n=89 (fire rings)						
1 View of Scenic Features	76	78	69	88		78
2 Proximity to Other Camps	57	58	77	47		60
3 Quality of Tent Site	57	48	64	57		57
4 Size of Fire Ring	61	37	54	68		55
5 Shelter from Weather	44	39	50	48		45
6 Distance from the Lake	19	18	20	24		20
7 Distance from Fresh Water	19	19	20	23		20
8 Size of Campsite	3	2	3	4		2
9 Rocks and Logs for Facilitation	1	1	3	1		1
10 Amount of Bare Ground	0	3	0	0		0

to lake" were combined into the category "distance from lake"). More detailed frequency distributions for separate variables are presented in Appendix C).

Table 5 presents the combined results for physical campsite characteristics at all 20 sites for the five study areas. An average ranking for each characteristic is presented (rankings are based on the frequency orderings for each site given in Table 4). The characteristics size of fire ring, rocks and logs for facilitation, and distance from the trail were not mentioned at all sites so their rankings were based only on the number of sites where they were mentioned.

Table 5. Combined Results of Physical Characteristics for all Sites

Characteristic	Average Ranking (n=20)
View of Scenic Features	1.4
Quality of Tent Site	3.0
Shelter from Weather	3.5
Proximity to Other Camps	3.6
Distance from the Lake	4.6
Size of campsite	6.5
Distance from Fresh Water	7.7
Amount of Bare Ground	7.8
Size of Fire Ring (n=8)	4.0
Rocks and Logs for Facilitation (n=8)	6.5
Distance from the Trail (n=5)	5.6

Across all sites, the view of scenic features was the most frequently mentioned factor. Quality of the tent site was next, followed closely by shelter from the weather and proximity to other camps. The amount of bare ground and the size of the fire ring were among the least mentioned characteristics.

Differences Between Hikers and Horse Riders

At Hunts Lake the sample included both hikers and horse riders. Both bare ground and fire rings were evaluated, and the items acceptability of impact, desirability of a site as a place to camp, and the rank order of preference for each site as a place to camp were compared to see if the two groups differed in their evaluations.

Acceptability Ratings of Specific Impacts

Table 6 presents the evaluations of hikers and horse riders regarding bare ground and fire rings. For acceptability of bare ground, overall mean scores for hikers (n=60) and horse riders (n=27) were significantly different at sites 2, 3, and 4. Results for site 2 show that hikers found the amount of bare ground somewhat less acceptable than horse riders (4.18 vs. 3.70 respectively). At site 3, the only site in the study where no bare ground was present, results show that the hikers found the lack of bare ground somewhat less acceptable than horse riders (2.88 vs. 2.27, respectively). At site 4 horse riders found the amount of bare ground to be somewhat less acceptable than hikers (2.20 vs. 1.52, respectively). There were no significant differences between groups at sites 1 and 5.

Table 6. Hiker/Horse Rider Acceptability[a] Ratings for Specific Impacts

Site	Mean Scores		F Value
	Hikers	Horse Riders	
Hunts Lake Bare Ground			
Site 1	2.72	2.57	.43
Site 2	4.18	3.70	4.25[b]
Site 3	2.88	2.27	4.10[b]
Site 4	1.52	2.20	6.50[b]
Site 5	1.82	1.81	.00
Hunts Lake Fire Rings			
Site 1	1.44	1.52	.17
Site 2	1.81	2.84	8.31[b]
Site 3	3.66	2.74	14.53[b]
Site 4	4.21	3.37	8.27[b]

[a]Based on a scale of 1 = Totally Acceptable, 2 = Somewhat Acceptable, 3 = Neutral, 4 = Somewhat Unacceptable, 5 = Totally Unacceptable

[b]$p \leq .05$

For the acceptability of fire rings, significant differences were found between the evaluations of hikers (n=62) and horse riders (n=21) at sites 2, 3, and 4. At site 2, which contains no fire ring, horse riders found the absence of this features less acceptable than hikers (2.84 vs. 1.81, respectively). Results for site 3 show that hikers found the size and appearance of the fire ring less acceptable than horse riders (3.66 vs. 2.74, respectively). At site 4 hikers found the size and appearance of the fire ring less acceptable than horse riders (4.21 vs. 3.37, respectively).

In evaluating specific impacts, then, there are differences between the two groups at the majority of sites. In general, horse riders tolerate larger areas of bare ground and larger fire rings with more charcoal. In areas without these impacts, horse riders found their absence less acceptable than do hikers.

Desirability Ratings of Sites Overall

Table 7 presents the overall desirability ratings of hikers and horse riders for the Hunts Lake bare ground and fire ring sites. For the bare ground sites, there were significant differences between groups only at site 3. Here, hikers found the site less desirable as a place to camp than horse riders. At the four sites where fire rings were evaluated, there were no significant differences between groups.

Preference Rankings for Sites Overall

Table 8 presents the overall preference rankings of hikers and horse riders. For the five bare ground sites, there were no differences

Table 7. Hiker/Horse Rider Desirability[a] Ratings for Sites Overall

Site	Mean Scores: Hikers	Horse Riders	F Value
Hunts Lake Bare Ground			
Site 1	2.27	1.90	3.57
Site 2	3.65	3.27	5.25
Site 3	3.25	2.65	5.25[b]
Site 4	2.85	2.96	.19
Site 5	2.05	1.96	.18
Hunts Lake Fire Rings			
Site 1	2.53	2.11	3.31
Site 2	2.02	2.15	.35
Site 3	3.06	2.63	2.55
Site 4	2.58	2.42	.37

[a] Based on a scale of 1 = Very Desirable, 2 = Somewhat Desirable, 3 = Neutral, 4 = Somewhat Undesirable, 5 = Very Undesirable

[b] $p \leq .05$

Table 8. Hiker/Horse Rider Preference[a] Rankings for Sites Overall

Site	Mean Scores: Hikers	Horse Riders	F Value
Hunts Lake Bare Ground			
Site 1	2.55	2.60	.02
Site 2	4.58	4.00	5.80
Site 3	3.43	3.32	.20
Site 4	2.58	2.30	.83
Site 5	1.92	2.28	1.47
Hunts Lake Fire Rings			
Site 1	2.47	2.37	.16
Site 2	1.90	2.74	8.76[b]
Site 3	3.21	2.47	7.87[b]
Site 4	2.42	2.42	.00

[a] Figures correspond to order in which site was preferred (1 = Most Preferred)

between groups. For the fire ring sites, there were signifcant differences between groups at sites 2 and 3. At site 2 (which had no fire ring), hikers found the site more preferable than horse riders (1.90 vs. 2.74, respectively). At site 3, which had a fire ring, hikers found the site less preferable than horse riders (3.21 vs. 2.47, respectively).

In general evaluations of desirability and preference, then, there are fewer differences between the two groups. Desirability ratings differed at only 1 out of 9 sites, and preference rankings differed at only 2 out of 9 sites.

Demographic Characteristics of Visitors

The descriptive statistics obtained from the 427 questionnaires show that visitors tended to be young; 73 percent were between 19 and 37 years of age. The most common age, or mode, was 26, and the mean was 29. Seventy percent of the sample were males and 30 percent were females.

The average party size was 4.5 persons. Forty-six percent were parties of one or two persons, thirty-five percent were parties of three or four, and seven percent were parties of ten or more. The largest party sampled contained 25 people.

In terms of outdoor experience, 51 percent of the visitors said they were "experienced" or "very experienced," while forty-nine percent ranked themselves as "moderately experienced" or "novice." The majority (59 percent) had visited the study area previously.

The people sampled were well educated; 59 percent had graduated from college and 13 percent had advanced degrees. Married and single visitors were about equally distributed, with 49 percent single and 48 percent married. A more detailed presentation of demographic information is in Appendix D.

The results of this study were compared to those of Hendee et al.'s (1968) study dealing with wilderness users in three different northwest wilderness areas. Respondents in the present study were younger, more of them were single, and on the average they had more years of schooling than the respondents in the earlier study.

DISCUSSION AND IMPLICATIONS FOR MANAGEMENT

Differences Between Measurement Methods

In general, there were few significant differences between measurement methods when evaluating the acceptability of specific forms of campsite impacts. When using the three methods to measure how visitors perceive the acceptability of bare ground or fire rings the photographic method agreed with site evaluations at 18 out of 20 sites (90%), and the written method agreed with site evaluations at 16 out of 20 sites (80%). The hypothesis that methods would agree was confirmed in most cases. Although there have been no previous studies which have evaluated specific features such as the wilderness campsite impacts investigated here, results are similar to those found by other researchers (e.g., Coughlin and Goldstein, 1970; Daniel and Boster, 1975; Shaffer and Richards, 1974; and Shuttleworth, 1980) dealing with substitute measurement methods for evaluative or assessment purposes. If substitute methods such as photographs accurately represent what respondents view in the field, the substitute methods generally elicit similar evaluations.

The differences which <u>were</u> found in the present study are discussed in the following pages. Differences for the acceptability of specific impacts will be discussed by the location in which they occurred. Differences for the more general evaluations of desirability

and preference will be discussed categorically rather than on a site-specific basis.

Acceptability of Bare Ground at Bays Lake

Results for acceptability of bare ground at Bays Lake showed that at site number 2 the amount of bare ground was more acceptable to respondents using the photographic method. The reasons for this difference are similar to those discussed by Dunn (1976), where differences between on-site and photographic methods were attributed to the failure of the photographic method to accurately portray important attributes of the site. In the present study, the photograph of site 2 at Bays Lake (see Appendix A) does not accurately portray the expanse of bare ground and the extent of root and rock exposure. The two dimensional image of the photograph tends to enhance the appearance of the surrounding vegetation in the scene, creating an appearance that trees in the background are bordering the site, when actually they are on the opposite shore of the lake. In contrast, the written site description (see Appendix B) focuses more on the expanse of bare ground and root and rock exposure, and the on-site method allowed respondents to see these features. Shuttleworth (1980) points out that the distortion of scale and the immediate environment (e.g., foreground and background) may be potential problems when using photographs as substitutes for on-site evaluations. However, he concluded that the use of wide-angle photography might help in eliminating this problem. In retrospect,

it appears that the photograph used in the present study presented an image which visually increased the amount of vegetation, therefore eliciting responses which were somewhat more acceptable from respondents using the photographic method.

Acceptability of Bare Ground at Hunts Lake

At Hunts Lake, significant differences were found between methods at three of the five sites. At site 1, respondents using the photographic method said the amount of bare ground was less acceptable. The photograph used to evaluate the amount of bare ground (see Appendix A) appears somewhat dark and does not emphasize the amount of vegetation bordering the site. In contrast, the written description (see Appendix B) allows the respondent to focus less on the bare ground and the on-site evaluation allowed the respondent to take in all elements of the site.

At site 2 respondents using the written method found the amount of bare ground more acceptable. Although the written description does point out on the root and rock exposure (see Appendix B), the actual extent of the bare ground would be difficult to accurately portray without lengthening the text considerably.

For site 5, the on-site method produced responses which indicated greater acceptability for the amount of bare ground. Neither the description nor the photograph of the site convey the nice location of a nearby creek or the fact that the surrounding vegetation helps isolate the site. Although in theory these factors

should not affect the rating of the amount of bare ground at the site, it is possible that they contributed to the "more acceptable" rating.

Acceptability of Fire Rings at Russell Lake

At Russell Lake the only significant difference between methods occurred at site 2. Here respondents using the written description found the fire ring more acceptable than respondents using on-site or photographic methods. When comparing the written description (see Appendix B) to the photograph (see Appendix A), the description does not convey enough about the actual amount of charcoal and pieces of wood spreading out from the fire ring. This appears to explain why respondents evaluating the fire ring from the written description found it more acceptable.

Acceptability of Fire Rings at Hunts Lake

At Hunts Lake there were no significant differences between methods at three of four campsites. The exception was site 4, where respondents using the written method found the fire ring less acceptable. The written description for site 4 (see Appendix B) places heavy emphasis on the "large chunks of charred wood" and "spreading charcoal" found at this fire ring, without giving the respondent an accurate feeling for the actual number of pieces. Respondents using the photographic or on-site methods were able to

see that there were only two pieces of charred wood in the fire ring, so they found the fire ring more acceptable.

Desirability Ratings for Sites Overall

There was more disagreement among methods when evaluating sites for their overall desirability as places to camp. Unlike most landscape assessment studies, which focus on panoramic scenes in order to test significance between on-site and photographic methods, the present study focused on individual sites. The problem here is similar to the content problem pointed out by Dunn (1976). When using a small number of photographs to depict a campsite, the emphasis must be on the site itself; background features such as lakes, mountains, meadows, and other nearby campsites cannot be portrayed well. When respondents evaluate the overall desirability of a site, however, external features (such as views of scenic features) play an important role in the assessment. With written descriptions, it is similarly difficult to convey background and context features without some form of visual representation. It seems likely then, that for evaluating campsites for overall desirability evaluations, the on-site method works best apparently because it allows a more complete representation of all site characteristics.

Preference Ranking for Sites Overall

There was also greater disagreement among methods when ranking sites in order of preference. As with desirability rankings,

preference rankings depend heavily on the relationships among background and context characteristics of a site. While the photographic method agreed with site evaluations at 15 out of 20 sites and the written method agreed with site evaluations at 16 out of 20 sites, the differences between methods can probably be attributed to the failure of photographic and written representations to incorporate all of the characteristics of any one site.

In summary, then, the results show agreement between methods the majority of the time. Photographs are slightly better than written descriptions at producing results which correspond to those produced by actual site evaluations for specific forms of campsite impacts. When rating the overall desirability or general preference of campsites there is slightly more disagreement between the three methods. Photographs appear to be better than written descriptions as substitutes when ranking the overall desirability of campsites and written descriptions seem to be better substitutes for general preference rankings of sites.

The findings of the present study do not directly support the conclusions presented in landscape assessment studies by Coughlin and Goldstein (1970) and Zube et al. (1974). Coughlin and Goldstein (1970) concluded that photographs were adequate substitutes for field observations for assessments of site values for specific uses such as fishing, nature study, or picnicking and also for overall preference ratings of the scenic quality of landscapes. Zube et al. (1974) concluded that photographs were not reliable substitues when dealing with perceptions of specific characteristics within a

landscape, but photographs were substitutable when dealing with overall perceptions of landscapes.

It is recommended that when perception studies that seek to measure how visitors or managers feel about campsite impacts are undertaken, photographs can be effectively used in place of on-site evaluations. However, certain factors which were discussed in the present study need to be controlled for. First, much thought and care is needed in taking and selecting photographs that are representative of the site characteristics and the forms of impact to be evaluated.

Second, when using photographs to depict the amount of vegetative coverage of a site, it must be realized that photographs are two dimensional images and that the actual distance of certain background features may appear different in a photograph than they would in an actual site evaluation. This is due to the photograph's inability to accurately portray the real depth of the scene. Wide-angle photography can help in eliminating this problem but any feature which might be in between foreground and background vegetative features (i.e., lakes) should be depicted as best as possible in the photograph.

Third, a reference of scale, such as a person, which was used in the present study, is necessary if observers are evaluating the amount of bare ground or size of fire ring. The square footage of a site or diameter and height of a fire ring are difficult for most people to judge even with a reference of scale. Without some representative form of scale the reliability of responses would be jeopardized.

Written descriptions of site impacts were somewhat less effective than photographs. Written descriptions are less accurate at portraying actual site conditions and without some form of visual representation the consistency of what is being evaluated cannot be controlled for as well as with a photograph. Although site descriptions could be lengthened to portray in fine detail existing site conditions, it would be difficult to order the detail in a way that would not be confusing to respondents. It is possible that both a written description along with a photograph representation of site impacts could be combined for evaluative purposes. However, there might be confusion when switching between methods while making the evaluation. In light of the effectiveness of the photographic method there seems little need to really test this approach.

When using photographs as substitutes for site evaluations, it is recommended that pretesting be done and a comparison made between responses received for photographs and site evaluations. By pretesting, any problems found with the photographic representation can be corrected before the actual sampling begins.

Evaluative Standards

The development of evaluative standards was based on the approach outlined by Vaske (1978), Shelby (1981), and Shelby and Heberlein (1982) for establishing encounter norms. As with encounter norms or contact preferences, evaluative standards for ecological impacts at wilderness campsites involve normative definitions of what is appropriate. In the case of campsite impacts, the appropriate

amount of bare ground or size and appearance of the fire ring was based on the shared beliefs of visitors about the appropriate levels of impact at a particular wilderness setting.

As pointed out by Shelby (1981), the "right" number of encounters will vary depending on the experience desired. The same is true for acceptable levels of impact. The acceptable amount of bare ground or size of fire ring is based on what visitors feel is appropriate for the type of experience they are seeking. If visitors are seeking a wilderness camping experience in an area where they expect to find little evidence of previous use, it is likely that a given impact would be evaluated as less acceptable than it would be in an area where prior use was known to exist.

In the present study, acceptable levels of impact were not uniform for all areas; they varied depending on location. This agrees with the findings of Shelby (1981), who points out that encounter norms vary, depending on where encounters take place (on the river or at camps). Consider, for example, the difference between the acceptable levels of bare ground at Scout and Bays Lake. Although these two lakes are close to one another (¼ mile), Bays Lake receives less use than Scout Lake because it is not located directly adjacent to the Pacific Crest National Scenic Trail, has fewer campsites, and visitors who select Bays Lake as a place to camp are usually trying to get away from the large number of groups and the more crowded environment of Scout Lake. The results show that the acceptable level for bare ground at Scout Lake campsites was approximately 1500 sq. ft., while at Bays Lake acceptable levels dropped to approximately 700 sq. ft. The findings for Bays Lake

were more in agreement with those at the somewhat remote location of Hunts Lake, where the acceptable level for bare ground was approximately 800 sq. ft.

The findings for the acceptability of fire rings also support the findings of Shelby (1981). At Russell Lake in Jefferson Park, the results show that the fire ring exceeding acceptable limits was 36 inches in diameter, 10 inches high, and had large amounts of charcoal, charred wood, and small bits of litter. However, at Hunts Lake, which receives less use, the fire ring exceeding acceptable limits was 22 inches in diameter, 6-8 inches high with large amounts of charcoal inside the fire ring, and charcoal spreading onto the ground.

The curve which was developed to plot the acceptability of specific impacts was based on the "contact preference curve" used by Shelby and Heberlein (1982). The "campsite impact norm curve" used in the present study (see Figures 4-8) shows (1) the optimum impact level, which is represented by the highest point on the curve and represents the ideal situation; (2) the range of tollerable impacts, which is represented by the portion of the curve above the neutral point; (3) the point at which contacts exceed the acceptable limit, which is the upper limit for evaluative standards; and (4) the intensity of a norm, which is indicated by the distance of the curve above and below the neutral line.

By using this approach to plot acceptable limits for campsite impacts, evaluative standards were developed for the two forms of campsite impacts at the five study locations. It is interesting

that campsites where there was no impact (no bare ground or fire ring) were ranked as less acceptable than sites which had small amounts of bare ground or small fire rings. This is probably because visitors actually identify campsites by the presence of bare ground and some evidence of previous fire building; areas without these impacts may not be considered campsites. Some respondents also thought that camping on vegetation is damaging to the environment and all camping should be done at pre-existing sites (which are defined by areas of bare ground and previous evidence of campfires).

In summary, then, the findings of this study suggest that evaluative standards for ecological impacts can be set based on visitor perceptions. The strategy suggested by Shelby and Heberlein (1982) for setting evaluative standards based on the preferences or values of individuals was used in the present study, and the results showed that this format can be used to help specify the evaluative standards which are needed to determine ecological carrying capacities in wilderness settings.

Physical Characteristics and Site Selection

Although the rating of physical campsite characteristics was not the primary emphasis of the study, visitors were asked about the types of characteristics they considered important at each campsite they viewed. The combined results for physical characteristics at all campsites showed that the four most important physical characteristics were view of scenic features, quality of tent site, shelter from weather, and proximity from other camps.

Scenic features most often in view of the campsites were mountains and lakes. This corresponds with the findings of Brown and Shoemaker (1974), which showed that of the 88 campsites evaluated in the Spanish Peaks Primitive Area, 65 percent of all sites had views of lakes. Few other features were frequently recorded. A study by Zuckert (1980), which focused on campsite selection at Charlotte Lake in Kings Canyon National Park, also found that view features were important. Of the 54 campsites used in the study, 94 percent had either an unobstructed or limited view of the lake, and 100 percent of the sites had an unobstructed or limited view of mountain peaks.

The functional characteristics of tent sites (i.e., flatness or size) were also important to respondents evaluating sites in this study. Results reported by Brown and Shoemaker (1974) and Zuckert (1980) also support this finding. Brown and Shoemaker (1974) concluded that for the 88 campsites they examined, all were six percent slope or less and most were four percent or less. Zuckert (1980) concluded that campsites were generally flat, with 56 percent being level and 44 percent having a slope of 15 percent or less.

Shelter from weather was listed third in order of importance for campsite characteristics in this study. Findings reported by Zuckert (1980) found that 52 percent of the campsites at Charlotte Lake were well protected from wind, 33 percent were moderately protected, and only 15 percent were poorly protected.

Previous research has shown that visitors place a high value on campsite solitude (Stankey, 1973; Lucas, 1980; Shelby 1981). In nine wilderness areas studied by Lucas (1980), the majority of

respondents preferred to have no other parties camped within sight or sound of them. Shelby (1981) concluded from three river studies that respondents defined a wilderness experience as being away from other parties virtually all of the time. Data presented in this study support the previous findings; the characteristic "proximity to other camps" was fourth in order of importance for all study sites, suggesting that visitors prefer campsites which are located away from other parties.

The campsite impacts focused on by this study were not a major factor in what visitors considered important about a campsite. The amount of bare ground at campsites appeared to be of little concern to respondents compared to other campsite characteristics. Bare ground seemed to be mentioned frequently by visitors only at sites where the amounts were extensive or where there was not enough bare ground so the area could be easily identified as a campsite.

Fire rings were mentioned more often than bare ground, but they were present only at sites where fire rings were being evaluated. In many instances fire rings were mentioned because they did not meet the particular needs of the individual (i.e., cooking purposes), not always because fire ring impacts were seen as acceptable or unacceptable. Other studies which have looked at physical characteristics of campsites have shown that campsite impacts are not a major influence on visitors' choice of campsites (Zuckert, 1980; Frissell and Duncan 1965; Merriam and Smith, 1974; Echelberger and Moeller, 1977). Zuckert (1980) concluded that perceptions of resource overuse do not clearly influence the type of campsite chosen. Frissell and Duncan (1965) also concluded that campsite impacts

did not influence a visitors' choice of campsites. Merriam and Smith (1974) found that visitors seldom mentioned impact conditions at campsites, and Echelberger and Moeller (1977) had no mention of campsite impact conditions included in responses to a question dealing with most and least liked characteristics of the area.

Differences Between Hikers and Horse Riders

At Hunts Lake, where horse riders were included in the study sample, most differences between groups were for evaluations of specific impacts. In general, hikers were less tolerant of larger amounts of bare ground and larger fire rings. They also found the absence of a fire ring at a site more acceptable than did horse riders. For horse riders, however, the camp with all grass and no bare ground was more acceptable and more desirable. This could be because hikers were more worried about damaging the vegetation if they camped on it, a concern expressed informally by many hikers.

The differences between groups found in this study are supported by data from other studies by Stankey (1973) and Lucas (1980). Stankey (1973) found hikers and horse riders differed in opinion about whether both backpacking and horse riding were appropriate ways to travel in wilderness. He also found that nearly half of the hikers sampled preferred not to meet horse riders, while 62 percent of the horse riders did not care if they encountered hikers. Lucas (1980) found that in about half of the nine wilderness areas studied, hikers were better satisfied than horse users with their overall wilderness trip.

Conclusion

It is recommended that further research be done on how wilderness visitors and managers perceive impacts in order to better define acceptable limits of ecological change. Management actions are often unclear to visitors who use the wildland resources. Managers who perceive visitors to be in agreement with them may be reluctant to undertake studies to test for agreement because of the expense of on-site evaluations. This study has shown photographs to be an accurate and relatively inexpensive means of gathering responses of wildland visitors.

By incorporating visitor perceptions into the decision-making process, managers can help legitimize actions which are often seen as arbitrary judgements by those who are ultimately affected.

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APPENDICES

APPENDIX A

PHOTOGRAPHIC REPRESENTATIONS OF INDIVIDUAL STUDY SITES

Pages 71 - 110

Located in Separate Binding

Appendix B

Written Descriptions of Study Sites

HUNTS LAKE - General Description

The campsites you will be evaluating are located at Hunts Lake, a popular destination in the Mt. Jefferson Wilderness. All campsites are located on the south side of the lake approximately 200 feet from the water. The campsites will accommodate 2 persons with one tent or tarp. Please keep this in mind while completing the questionnaire.

Hunts Lake, Site #1F

This site is 20' x 20' in size. No view of the lake or surrounding mountains is afforded the visitor at this site. It is sheltered from the wind and is located 25 feet away from another campsite. The fire ring at this site is about 16 inches in diameter and 6 inches high and contains small amounts of charcoal and no litter.

Hunts Lake, Site #2F

This site is 25' x 32' in size. No view of the lake or surrounding mountains is afforded the visitor at this site. It is sheltered from the wind and is located 25 feet from another campsite. There are logs for sitting. There is no fire ring at this campsite.

Hunts Lake, Site #3F

This site is 25' x 20' in size. No view of the lake or surrounding mountains is afforded the visitor here, however, there is a view of the meadow to the south. Some shelter is provided from the wind and it is located 30 feet from another campsite. The fire ring at this site is 22 inches in diameter and about 6-8 inches high. The fire pit contains large amounts of charcoal which spread out from the fire pit onto the ground.

Hunts Lake, Site #4F

This site is 20' x 20' in size. A view of the lake, surrounding mountains and meadow is afforded the visitor at this site. It provides minimal shelter from the wind and is located 15 feet away from another campsite which is partially obscured by a vegetative buffer. There are logs for sitting. The diameter of the fire ring is 38 inches and about 14-16 inches high. It contains large hunks of charred wood, small bits of litter, and small hunks of charcoal which spread out from the fire pit onto the ground.

RUSSELL LAKE - General Description

The campsites you will be evaluating are all located about 600 feet from Russell Lake, a popular destination in the Mt. Jefferson Wilderness. All the sites are located in a large grove of mountain hemlock and true fir, with surrounding ground vegetation consisting mainly of huckleberry. All are essentially out of sight of other camps around the lakeshore. Each campsite has a view of Russell Lake, Mt. Jefferson, and surrounding meadows.

Russell Lake, Site #1

This site is 25' x 17' in size. It is sheltered from the wind and is located 8 feet away from another campsite. There is no fire ring at this campsite.

Russell Lake, Site #2

This site is 25' x 30' in size, and it is sheltered from the wind. It is located 6 feet away from another campsite. The fire ring at this site is 36 inches in diameter, 10 inches high and it contains large hunks of charcoal, charred wood, and small bits of litter.

Russell Lake, Site #3

This site is 17' x 10' in size and is located 6 feet away from another campsite. The fire ring is 18 inches in diameter and about 6-8 inches high, and it contains only white ash and no litter.

Russell Lake, Site #4

This site is 35' x 24'. The site is more open to the east and south and is bordered here by large rocks, mountain hemlock, and huckleberry. It is somewhat exposed to the wind and is located 15 feet away from another campsite.

The fire structure at this site is about 7 feet long, 3½ feet wide, and 2-2½ feet high. It contains two separate fire pits, one 39 inches and the other 34 inches in diameter. Both fire pits contain large amounts of charcoal, large chunks of charred wood, and some litter.

HUNTS LAKE - General Description

The campsites you will be evaluating are located at Hunts Lake, a popular destination in the Mt. Jefferson Wilderness. All sites offer an unobstructed view of the lake and the surrounding mountains. Each site is visible from other points around the lakeshore. The campsites will accommodate 2 persons with one tent or tarp. Please keep this in mind while completing the questionnaire.

Hunts Lake, Site #1b

This site is located on the west side of Hunts Lake, 60 feet from the water. The closest site is about 25 feet away.

The overall size of the site is 27' x 32' and the amount of bare ground is 24' x 28'. The site is bordered by mountain hemlock, true fir, and ground vegetation which is mainly grass and huckleberry.

Hunts Lake, Site #2b

This site is located on the west shore of Hunts Lake, approximately 5 feet from the water. The closest site is about 15' away.

The overall size of the site is 36' x 39', all of which is bare ground. The roots of the surrounding trees are exposed throughout the site and several rocks protrude above the ground. The site is bordered by mountain hemlock, true fir, and ground vegetation which is mainly huckleberry.

Hunts Lake, Site #3b

This site is located on the west side of Hunts Lake, 20 feet from the water. The closest site is about 15 feet away.

The overall size of the site is 36' x 27', all of which is covered with grass. The surrounding vegetation is alder, true fir, and mountain hemlock.

Hunts Lake, Site #4b

This site is located on the west shore of Hunts Lake, approximately 6 feet from the water. The closest campsite is 10 feet away.

The overall size of the site is 45' x 21'. The site is predominately covered with grass except for a patch of bare ground approximately 6' x 7'. The site is bordered by small patches of alder and noble fir.

Scout Lake, Site #4

This site is located in a grove of trees on the south rim of the lake, approximately 100 feet back from the lakeshore. It offers a view of the lake, but a large stand of mountain hemlock blocks the view of Mt. Jefferson. The site is secluded from the trail but is visible from the north and east sides of the lake. The closest campsite is 10 feet away.

The overall size of the site is 65' x 35', all of which is bare ground. The site is bordered by mountain hemlock and true firs. Some small clumps of grass and huckleberry are creeping into the site from the perimeter.

BAYS LAKE - General Description

The campsites you will be evaluating are located on the northwest side of Bays Lake, a popular destination within the Mount Jefferson Wilderness. Each site has an unobstructed view of the lake and Mt. Jefferson, and each will accommodate two persons with one tent or tarp. Please keep this in mind while completing the questionnaire.

Bays Lake, Site #1

This site is located approximately 15 feet from the lake and 15 feet from another campsite. This site offers some seclusion and it is not visible from most points around the lake.

The overall size of the site is 15' x 15', and about 12' x 13' of this is bare ground. The site is bordered by true firs, mountain hemlock, and ground vegetation that consists mainly of huckleberry and bear grass.

Bays Lake, Site #2

This site is located approximately 20 feet from the lake and 8 feet from another campsite. The site is visible from many points around the lake.

The overall size of the site is 22' x 24', all of which is bare ground. Many rocks and roots protrude above the ground and the site is sparsely vegetated with mountain hemlock, true firs, and huckleberry.

Bays Lake, Site #3

This site is located approximately 15 feet from the lake and 8 feet from another campsite. The site is visible from many points around the lake.

The overall size of the site is 36' x 27', all of which is bare ground. Rocks and roots protrude above ground and the site is sparsely vegetated with mountain hemlock, true firs, and huckleberry.

Appendix C

Complete Questionnaire Data

MT. JEFFERSON CAMPSITE EVALUATIONS QUESTIONNAIRE

In this section I would like to ask some questions about your contacts with other people around your campsite. All questions refer to acceptable contact levels for a wilderness camping experience here at Jefferson Park/Hunts Cove.

How far should another camp be from yours? Please specify the minimum acceptable distance.

1	2	3	4	5
0%	5%	16%	30%	48%
10-25 Feet	26-50 Feet	51-75 Feet	76-100 Feet	>100 Feet

1% Makes no difference to me

When you are at your campsite, how often should you be able to see other parties?

0%

12.5 Not at all
74.0 Occasional glimpses
13.2 Fairly regularly
.5 Constantly in sight
2.8 Makes no difference to me

When you are at your campsite, how often should you be able to hear other parties?

0%

17.7 Not at all
74.5 Occasional sounds
6.4 Fairly regularly
0 Constantly hear
1.4 Makes no difference to me

What is the highest number of groups you would tolerate before it would no longer be a Jefferson Park/Hunts Cove wilderness experience?

$\bar{X}$

2.7 Maximum number of parties within sight
2.3 Maximum number of parties within sound
2.3 Maximum number within sight and sound
.34 Right next to you (within 25 feet)

To have fewer people around the shoreline, would you be willing to camp further back from the lake?

5% no 95% yes

If yes, how far from the lake would you be willing to camp?

1	2	3	4	5
29%	17%	27%	16%	38%
50 Feet	100 Feet	200 Feet	300 Feet	Out of Sight

To have fewer people around the shoreline would you be willing to camp in a site without a view of the mountain? 23% no 77% yes

Below are 11 characteristics which might be considered in selecting a campsite. Please rank all 11 in terms of their importance to you when selecting a campsite. 1=most important, 11=least important.

1 Flat place for sleeping
3 Good view of scenery
9 Available fire wood
2 Availavle drinking/cooking water
8 Water for aesthetics
5 Shelter from weather
10 Amount of bare ground
11 Size and appearance of fire ring
4 Distance from other camps
6 Distance from the trail
7 Overal aesthetics

In this section, I would like to ask some questions about your backcountry travel experience.

How many years have you been visiting wilderness/backcountry areas?

7% First time $\bar{X}$ 8.6 Years

Onthe average, how many days per year do you spend in wilderness or backcountry areas?

$\bar{X}$ 13 Days

How many days have you spent in the Mt. Jefferson wilderness over the past year? Please include this visit.

$\bar{X}$ 4.5 Days

How many times have you previously visited this particular area?

$\bar{X}$ 1.8 Times

When visiting wilderness or backcountry areas, what is your usual method of travel?

90% Hiking 10% Horse riding

What is your method of travel on this trip?

90% Hiking 10% Horse riding

How many people and pack and saddle stock in your group?

$\bar{X}$ 4.5 People .8 Stock

What is your level of experience when it comes to wilderness/backcountry travel?

Novice	Moderately Experienced	Experienced	Very Experienced
11%	38%	38%	12%

In this section I would like to ask some questions about your background. This information will be helpful in comparing your answers to those of other people. All of your answers are ***strictly confidential.***

$\bar{X}$ 29 What is your age? (years old)

Are you 70% male; 30% female?

How many years of school have you completed 1 2 3 4 5 6 7 8 9 10 11 12 97%

Some college? 28% B.A./B.S. or equivalent: 59%

Advanced degree (Ph.D., M.D., etc.)? 13%

What is your primary occupation? Please be as specific as possible. If you are a homemaker, please indicate the occupation of your spouse. If retired, give former occupation.

_____

Please check the space which comes closest to your total family income before taxes:

6% 0 - $3999	15% $24,000 - $27,999
7% $5,000 - $7,999	11% $28,000 - $31,999
10% $ 8,000 - $11,999	4% $32,000 - $35,999
15% $12,000 - $15,999	2% $36,000 - $39,999
30% $16,000 - $19,999	3% $40,000 - $43,999
13% $20,000 - $23,999	1% $44,000 - $47,999
	6% More than $48,000

N = 397

Are you:

49% Single

48% Married

3% Divorced

$\bar{X}$ How many children do you have? 1

Where do you presently live?

14 rural area

30 small city

9% 34 large city

8 small town

14 suburban area

In case we need to send you a follow up questionnaire, we need your name and address. This information will be kept confidential.

NAME: _____

STREET ADDRESS: _____

CITY, STATE, ZIP: _____

Scout Lake

MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # 1.

In general, what are your feelings about this campsite?

35	Too far from lake	52	Too small a site
0	Too close to lake	0	Too large a site
24	Too far away from drinking/cooking water	7	Good shelter from weather
89	Nice view of lake/mountain	18	Poor shelter from weather
0	No view of lake/mountain	24	Good tent spot
4	Too close to other sites	29	Poor tent spot
48	Secluded from other sites	70	Other _____

4 Too much bare ground
11 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
27%	28%	10%	34%	1%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
65%	28%	1%	5%	1%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 2.

In general, what are your feelings about this campsite?

33	Too far from lake	0	Too small a site
3	Too close to lake	9	Too large a site
21	Too far away from drinking/cooking water	42	Good shelter from weather
96	Nice view of lake/mountain	5	Poor shelter from weather
0	No view of lake/mountain	60	Good tent spot
0	Too close to other sites	0	Poor tent spot
33	Secluded from other sites	82	Other _____

9 Too much bare ground
0 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
16%	73%	6%	4%	0%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

1% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
3%	75%	9%	13%	0%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # 3.

In general, what are your feelings about this campsite?

26	Too far from lake	0	Too small a site
5	Too close to lake	30	Too large a site
18	Too far away from drinking/cooking water	32	Good shelter from weather
96	Nice view of lake/mountain	8	Poor shelter from weather
0	No view of lake/mountain	59	Good tent spot
1	Too close to other sites	0	Poor tent spot
14	Secluded from other sites	9	other

76 Too much bare ground
0 Not enough bare ground

9%

How desirable is this site as a place to camp?

1	2	3	4	5
4%	60%	8%	28%	0%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
2%	23%	5%	70%	0%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 4.

In general, what are your feelings about this campsite?

54	Too far from lake	0	Too small a site
0	Too close to lake	88	Too large a site
20	Too far away from drinking/cooking water	52	Good shelter from weather
76	Nice view of lake/mountain	0	Poor shelter from weather
10	No view of lake/mountain	40	Good tent spot
65	Too close to other sites	0	Poor tent spot
0	Secluded from other sites	78	Other _____

57 Too much bare ground
0 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
1%	12%	5%	56%	26%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
0%	0%	2%	35%	63%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. 2 1 3 4

BAYS LAKE

MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # 1.

In general, what are your feelings about this campsite?

- 0 Too far from lake
- 38 Too close to lake
- 0 Too far away from drinking/cooking water
- 50 Nice view of lake/mountain
- 0 No view of lake/mountain
- 37 Too close to other sites
- 30 Secluded from other sites
- 43 Too small a site
- 0 Too large a site
- 45 Good shelter from weather
- 0 Poor shelter from weather
- 41 Good tent spot
- 13 Poor tent spot
- 16 Other _____

0% — 0 Too much bare ground; 1 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
12%	59%	4%	23%	2%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
71%	24%	4%	1%	
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 2.

In general, what are your feelings about this campsite?

- 0 Too far from lake
- 40 Too close to lake
- 0 Too far away from drinking/cooking water
- 76 Nice view of lake/mountain
- 0 No view of lake/mountain
- 66 Too close to other sites
- 0 Secluded from other sites
- 0 Too small a site
- 17 Too large a site
- 19 Good shelter from weather
- 30 Poor shelter from weather
- 41 Good tent spot
- 11 Poor tent spot
- 73 Other _____

8% — 27 Too much bare ground; 0 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
13%	45%	1%	30%	11%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
0%	28%	5%	54%	13%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # 3.

In general, what are your feelings about this campsite?

0 Too far from lake	0 Too small a site	47 Too much bare ground	
37 Too close to lake	60 Too large a site	0 Not enough bare ground	
0 Too far away from drinking/cooking water	0 Good shelter from weather		
57 Nice view of lake/mountain	35 Poor shelter from weather		
0 No view of lake/mountain	33 Good tent spot		
63 Too close to other sites	11 Poor tent spot		
0 Secluded from other sites	77 Other		

How desirable is this site as a place to camp?

1	2	3	4	5
8%	38%	1%	25%	28%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
4%	4%	0%	40%	52%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake	___ Too small a site	___ Too much bare ground	
___ Too close to lake	___ Too large a site	___ Not enough bare ground	
___ Too far away from drinking/cooking water	___ Good shelter from weather		
___ Nice view of lake/mountain	___ Poor shelter from weather		
___ No view of lake/mountain	___ Good tent spot		
___ Too close to other sites	___ Poor tent spot		
___ Secluded from other sites	___ Other _____		

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. 2 1 3 -

HUNTS LAKE
MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # 1.

In general, what are your feelings about this campsite?

8	Too far from lake	0	Too small a site
6	Too close to lake	22	Too large a site
0	Too far away from drinking/cooking water	13	Good shelter from weather
85	Nice view of lake/mountain	24	Poor shelter from weather
0	No view of lake/mountain	56	Good tent spot
46	Too close to other sites	0	Poor tent spot
1	Secluded from other sites	80	Other _____

8 Too much bare ground
1 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
17%	64%	5%	14%	0%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
15%	43%	2%	40%	0%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 2.

In general, what are your feelings about this campsite?

—	Too far from lake	2	Too small a site
51	Too close to lake	43	Too large a site
0	Too far away from drinking/cooking water	6	Good shelter from weather
77	Nice view of lake/mountain	30	Poor shelter from weather
0	No view of lake/mountain	26	Good tent spot
49	Too close to other sites	26	Poor tent spot
0	Secluded from other sites	56	Other _____

43 Too much bare ground
2 Not enough bare ground

How desirable is this site as a place to camp?

1	2	3	4	5
29%	31%	6%	35%	26%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
2%	12%	2%	48%	36%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # 3.

In general, what are your feelings about this campsite?

8	Too far from lake	2	Too small a site	0	Too much bare ground
36	Too close to lake %	18	Too large a site	49	Not enough bare ground
0	Too far away from drinking/cooking water	5	Good shelter from weather		
77	Nice view of lake/mountain	30	Poor shelter from weather		
0	No view of lake/mountain	31	Good tent spot		
56	Too close to other sites	21	Poor tent spot		
0	Secluded from other sites	51	other		

How desirable is this site as a place to camp?

1	2	3	4	5
8%	32%	10%	45%	5%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

02 makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
30%	20%	3%	47%	0%
Totally Acceptable	Somewnat Acceptable	Neutral	Somewnat Unacceptable	Totally Unacceptable

Site # 4/5

In general, what are your feelings about this campsite?

0	Too far from lake 0	7	Too small a site 5	2	Too much bare ground 1
45	Too close to lake 46 %	7	Too large a site 0	2	Not enough bare ground 0
0	Too far away from drinking/cooking water 0	0	Good shelter from weather 53		
4	Nice view of lake/mountain —	36	Poor shelter from weather 3		
0	No view of lake/mountain 0	63	Good tent spot 60		
64	Too close to other sites 53	8	Poor tent spot 5		
0	Secluded from other sites 21	54	Other 33		

How desirable is this site as a place to camp?

1	2	3	4	5
8%	41%	7%	43%	1%
Very Desirable	Somewnat Desirable	Neutral	Somewnat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
68%	10%	5%	17%	0%
Totally Acceptable	Somewnat Acceptable	Neutral	Somewnat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. 5 4 1 3 2

RUSSELL LAKE
MT. JEFFERSON CAMPSITE EVALUATION

FIRE RINGS

In this section, I would like to ask some questions about the campsite you are looking at.

Site # 1.

In general, what are your feelings about this campsite?

19	Too far from lake	0	Too small a site	0	Too much bare ground
0	Too close to lake	3	Too large a site	0	Not enough bare ground
19	Too far away from drinking/cooking water	42	Good shelter from weather	0	Fire ring too large
76	Nice view of lake/mountain	2	Poor shelter from weather	25	Fire ring too small
0	No view of lake/mountain	57	Good tent spot	34	Fire ring OK
55	Too close to other sites	0	Poor tent spot	1	Rocks and logs for sitting
2	Secluded from other sites	58	Other _____		

How desirable is this site as a place to camp?

1	2	3	4	5
8%	74%	4%	14%	1%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is ...

1	2	3	4	5
58%	16%	2%	23%	1%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 2.

In general, what are your feelings about this campsite?

18	Too far from lake	0	Too small a site	3	Too much bare ground
0	Too close to lake	2	Too large a site	0	Not enough bare ground
19	Too far away from drinking/cooking water	28	Good shelter from weather	11	Fire ring too large
78	Nice view of lake/mountain	11	Poor shelter from weather	0	Fire ring too small
1	No view of lake/mountain	40	Good tent spot	26	Fire ring OK
55	Too close to other sites	8	Poor tent spot	1	Rocks and logs for sitting
0	Secluded from other sites	69	Other _____		

How desirable is this site as a place to camp?

1	2	3	4	5
2%	55%	21%	20%	2%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is..

1	2	3	4	5
3%	46%	5%	44%	2%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (FIRE RINGS)

Site # 3.

In general, what are your feelings about this campsite?

20 Too far from lake
0 Too close to lake
30 Too far away from drinking/cooking water
69 Nice view of lake/mountain
0 No view of lake/mountain
57 Too close to other sites
20 Secluded from other sites

3 Too small a site
0 Too large a site
49 Good shelter from weather
0 Poor shelter from weather
64 Good tent spot
0 Poor tent spot
49 Other _____

0 Too much bare ground
0 Not enough bare ground
0 Fire ring too large
7 Fire ring too small
47 Fire ring OK
3 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
11%	61%	14%	12%	2%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
79%	12%	2%	6%	1%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 4.

In general, what are your feelings about this campsite?

24 Too far from lake
0 Too close to lake
23 Too far away from drinking/cooking water
89 Nice view of lake/mountain
0 No view of lake/mountain
36 Too close to other sites
11 Secluded from other sites

3 Too small a site
1 Too large a site
8 Good shelter from weather
40 Poor shelter from weather
10 Good tent spot
47 Poor tent spot
65 Other _____

0 Too much bare ground
0 Not enough bare ground
80 Fire ring too large
0 Fire ring too small
1 Fire ring OK
0 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
0%	24%	12%	55%	9%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is..

1	2	3	4	5
0%	1%	0%	38%	61%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 4 campsites you have just observed, which would you prefer to camp at? Please rank them from most desirable to least desirable. 2 3 1 4

When visiting wilderness/backcountry areas do you generally use a campfire for: (check all that apply)

51 Cooking
71 Sitting around and visiting with friends
53 Sitting around for warming
9 Keeping bugs away
24 Don't usually build fires

%

Do you usually carry a stove? 3 no 97 yes %

HUNTS LAKE

MT. JEFFERSON CAMPSITE EVALUATION

FIRE RINGS

In this section, I would like to ask some questions about the campsite you are looking at.

Site # 1.

In general, what are your feelings about this campsite?

49 Too far from lake %
0 Too close to lake
12 Too far away from drinking/cooking water
14 Nice view of lake/mountain
37 No view of lake/mountain
27 Too close to other sites
10 Secluded from other sites

0 Too small a site
6 Too large a site
59 Good shelter from weather
12 Poor shelter from weather
44 Good tent spot
8 Poor tent spot
63 Other _____

8 Too much bare ground
0 Not enough bare ground
0 Fire ring too large
7 Fire ring too small
53 Fire ring OK
10 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
8%	61%	8%	23%	0%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is ...

1	2	3	4	5
69%	24%	0%	7%	0%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 2.

In general, what are your feelings about this campsite?

48 Too far from lake %
0 Too close to lake
13 Too far away from drinking/cooking water
13 Nice view of lake/mountain
41 No view of lake/mountain
14 Too close to other sites
27 Secluded from other sites

4 Too small a site
1 Too large a site
69 Good shelter from weather
5 Poor shelter from weather
63 Good tent spot
0 Poor tent spot
42 Other _____

4 Too much bare ground
0 Not enough bare ground
0 Fire ring too large
17 Fire ring too small
8 Fire ring OK
66 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
26%	53%	10%	11%	0%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is..

1	2	3	4	5
58%	13%	0%	24%	5%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (FIRE RINGS)

Site # 3.

In general, what are your feelings about this campsite?

36 Too far from lake
0 Too close to lake
13 Too far away from drinking/cooking water
68 Nice view of lake/mountain
12 No view of lake/mountain
27 Too close to other sites
13 Secluded from other sites

39 Too small a site
0 Too large a site
45 Good shelter from weather
16 Poor shelter from weather
24 Good tent spot
24 Poor tent spot
52 Other

2 Too much bare ground
0 Not enough bare ground
28 Fire ring too large
0 Fire ring too small
18 Fire ring OK
48 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
4%	43%	7%	45%	1%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

0% makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
5%	19%	4%	70%	2%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # 4.

In general, what are your feelings about this campsite?

17 Too far from lake
0 Too close to lake
2 Too far away from drinking/cooking water
83 Nice view of lake/mountain
8 No view of lake/mountain
41 Too close to other sites
4 Secluded from other sites

12 Too small a site
0 Too large a site
13 Good shelter from weather
51 Poor shelter from weather
23 Good tent spot
16 Poor tent spot
42 Other

4 Too much bare ground
0 Not enough bare ground
54 Fire ring too large
0 Fire ring too small
4 Fire ring OK
22 Rocks and logs for sitting

How desirable is this site as a place to camp?

1	2	3	4	5
8%	60%	6%	24%	2%
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

__ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is..

1	2	3	4	5
7%	8%	0%	48%	37%
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 4 campsites you have just observed, which would you prefer to camp at? Please rank them from most desirable to least desirable. 2 4 1 3

When visiting wilderness/backcountry areas do you generally use a campfire for: (check all that apply)

63 Cooking
85 Sitting around and visiting with friends %
36 Sitting around for warming
11 Keeping bugs away
10 Don't usually build fires

Do you usually carry a stove? 15 no 85 yes %

Appendix D

Study Questionnaires

MT. JEFFERSON CAMPSITE EVALUATIONS QUESTIONNAIRE

In this section I would like to ask some questions about your contacts with other people around your campsite. All questions refer to acceptable contact levels for a wilderness camping experience here at Jefferson Park/Hunts Cove.

How far should another camp be from yours? Please specify the minimum acceptable distance.

1	2	3	4	5
10-25 Feet	26-50 Feet	51-75 Feet	76-100 Feet	>100 Feet

___ Makes no difference to me

When you are at your campsite, how often should you be able to see other parties?

___ Not at all
___ Occasional glimpses
___ Fairly regularly
___ Constantly in sight
___ Makes no difference to me

When you are at your campsite, how often should you be able to hear other parties?

___ Not at all
___ Occasional sounds
___ Fairly regularly
___ Constantly hear
___ Makes no difference to me

What is the highest number of groups you would tolerate before it would no longer be a Jefferson Park/Hunts Cove wilderness experience?

___ Maximum number of parties within sight
___ Maximum number of parties within sound
___ Maximum number within sight and sound
___ Right next to you (within 25 feet)

To have fewer people around the shoreline, would you be willing to camp further back from the lake?

___ no ___ yes

If yes, how far from the lake would you be willing to camp?

1	2	3	4	5
50 Feet	100 Feet	200 Feet	300 Feet	Out of Sight

To have fewer people around the shoreline would you be willing to camp in a site without a view of the mountain? ___ no ___ Yes

Below are 11 characteristics which might be considered in selecting a campsite. Please rank all 11 in terms of their importance to you when selecting a campsite. 1=most important, 11=least important.

___ Flat place for sleeping
___ Good view of scenery
___ Available fire wood
___ Availavle drinking/cooking water
___ Water for aesthetics
___ Shelter from weather
___ Amount of bare ground
___ Size and appearance of fire ring
___ Distance from other camps
___ Distance from the trail
___ Overal aesthetics

In this section, I would like to ask some questions about your backcountry travel experience.

How many years have you been visiting wilderness/backcountry areas?

___ First time ___ Years

Onthe average, how many days per year do you spend in wilderness or backcountry areas?

___ Days

How many days have you spent in the Mt. Jefferson wilderness over the past year? Please include this visit.

___ Days

How many times have you previously visited this particular area?

___ Times

When visiting wilderness or backcountry areas, what is your usual method of travel?

___ Hiking ___ Horse riding

What is your method of travel on this trip?

___ Hiking ___ Horse riding

How many people and pack and saddle stock in your group?

___ People ___ Stock

What is your level of experience when it comes to wilderness/backcountry travel?

1	2	3	4
Novice	Moderately Experienced	Experienced	Very Experienced

In this section I would like to ask some questions about your background. This information will be helpful in comparing your answers to those of other people. All of your answers are strictly confidential.

___ What is your age? (years old)

Are you ___ male; ___ female?

How many years of school have you completed 1 2 3 4 5 6 7 8 9 10 11 12

Some college?___ B.A./B.S. or equivalent?___

Advanced degree (Ph.D., M.D., etc.)?_____

What is your primary occupation? Please be as specific as possible. If you are a homemaker, please indicate the occupation of your spouse. If retired, give former occupation.

_____

Please check the space which comes closest to your total family income before taxes:

___ 0 - $3999
___ $5,000 - $7,999
___ $ 8,000 - $11,999
___ $12,000 - $15,999
___ $16,000 - $19,999
___ $20,000 - $23,999
___ $24,000 - $27,999
___ $28,000 - $31,999
___ $32,000 - $35,999
___ $36,000 - $39,999
___ $40,000 - $43,999
___ $44,000 - $47,999
___ More than $48,000

Are you:

_____ Single
_____ Married
_____ Divorced

How many children do you have? ____

Where do you presently live?

___ rural area
___ small city
___ large city
___ small town
___ suburban area

In case we need to send you a follow up questionnaire, we need your name and address. This information will be kept confidential.

NAME:_____

STREET ADDRESS:_____

CITY, STATE, ZIP: _____

MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this camosite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camo?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camo?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. _____ _____ _____ _____

MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

How focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

How focus your attention on the amount of bare ground at this site. Do you feel that it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. _____ _____ _____ _____

MT. JEFFERSON CAMPSITE EVALUATIONS

BARE GROUND

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the bare ground at this site. From the description, do you feel that the size and appearance of the bare ground is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the bare ground at this site. From the description, do you feel that the size and appearance of the bare ground is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (BARE GROUND)

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the bare ground at this site. From the description, do you feel that the size and appearance of the bare ground is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the bare ground at this site. From the description, do you feel that the size and appearance of the bare ground is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 3 or 4 campsites you have just observed, which would you prefer to camp at? Please rank them from the most desirable to least desirable. _____ _____ _____ _____

MT. JEFFERSON CAMPSITE EVALUATION

FIRE RINGS

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (FIRE RINGS)

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

___ Too far from lake
___ Too close to lake
___ Too far away from drinking/cooking water
___ Nice view of lake/mountain
___ No view of lake/mountain
___ Too close to other sites
___ Secluded from other sites
___ Too small a site
___ Too large a site
___ Good shelter from weather
___ Poor shelter from weather
___ Good tent spot
___ Poor tent spot
___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 4 campsites you have just observed, which would you prefer to camp at? Please rank them from most desirable to least desirable. ____ ____ ____ ____

When visiting wilderness/backcountry areas do you generally use a campfire for: (check all that apply)

___ Cooking
___ Sitting around and visiting with friends
___ Sitting around for warming
___ Keeping bugs away
___ Don't usually build fires

Do you usually carry a stove? ___ no ___ yes

MT. JEFFERSON CAMPSITE EVALUATION

FIRE RINGS

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (FIRE RINGS)

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now focus your attention on the size and appearance of the fire ring at this site. Do you feel it is...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 4 campsites you have just observed, which would you prefer to camp at? Please rank them from most desirable to least desirable. ____ ____ ____ ____

When visiting wilderness/backcountry areas do you generally use a campfire for: (check all that apply)

___ Cooking

___ Sitting around and visiting with friends

___ Sitting around for warming

___ Keeping bugs away

___ Don't usually build fires

Do you usually carry a stove? ___ no ___ yes

MT. JEFFERSON CAMPSITE EVALUATION

FIRE RINGS

In this section, I would like to ask some questions about the campsite you are looking at.

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

MT. JEFFERSON (FIRE RINGS)

Site # ___

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

___ Secluded from other sites ___ Other _____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Site # ___.

In general, what are your feelings about this campsite?

_____

_____

_____

_____

_____

How desirable is this site as a place to camp?

1	2	3	4	5
Very Desirable	Somewhat Desirable	Neutral	Somewhat Undesirable	Very Undesirable

___ makes no difference to me.

Now I would like to direct your attention back to the description of the fire ring at this site. From the description, do you feel that the size and appearance of the fire ring is ...

1	2	3	4	5
Totally Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Totally Unacceptable

Of the 4 campsites you have just observed, which would you prefer to camp at? Please rank them from most desirable to least desirable. ____ ____ ____ ____

When visiting wilderness/backcountry areas do you generally use a campfire for: (check all that apply)

___ Cooking

___ Sitting around and visiting with friends

___ Sitting around for warming

___ Keeping bugs away

___ Don't usually build fires

Do you usually carry a stove? ___ no ___ yes